

Figure 1

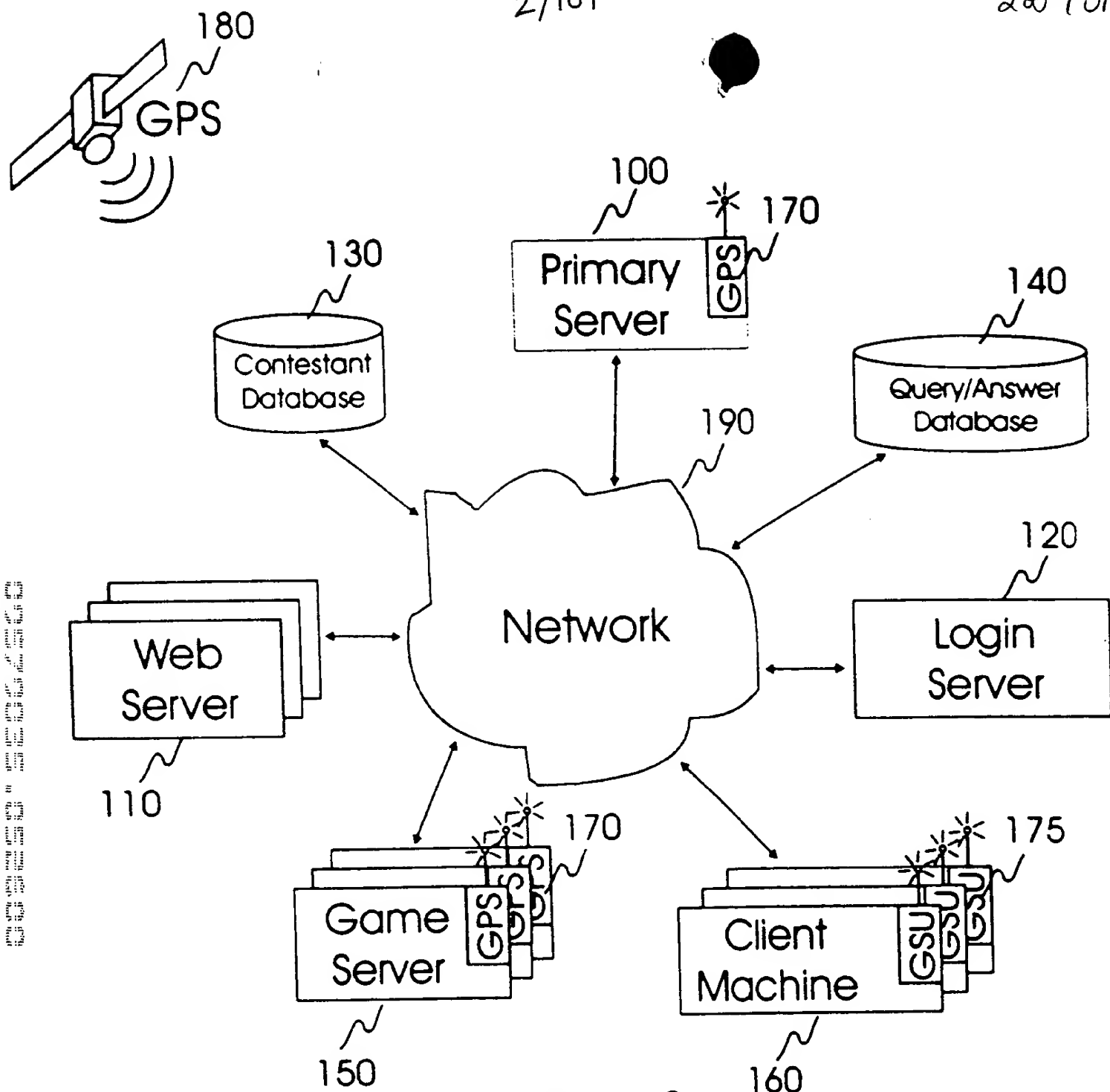


Figure 2

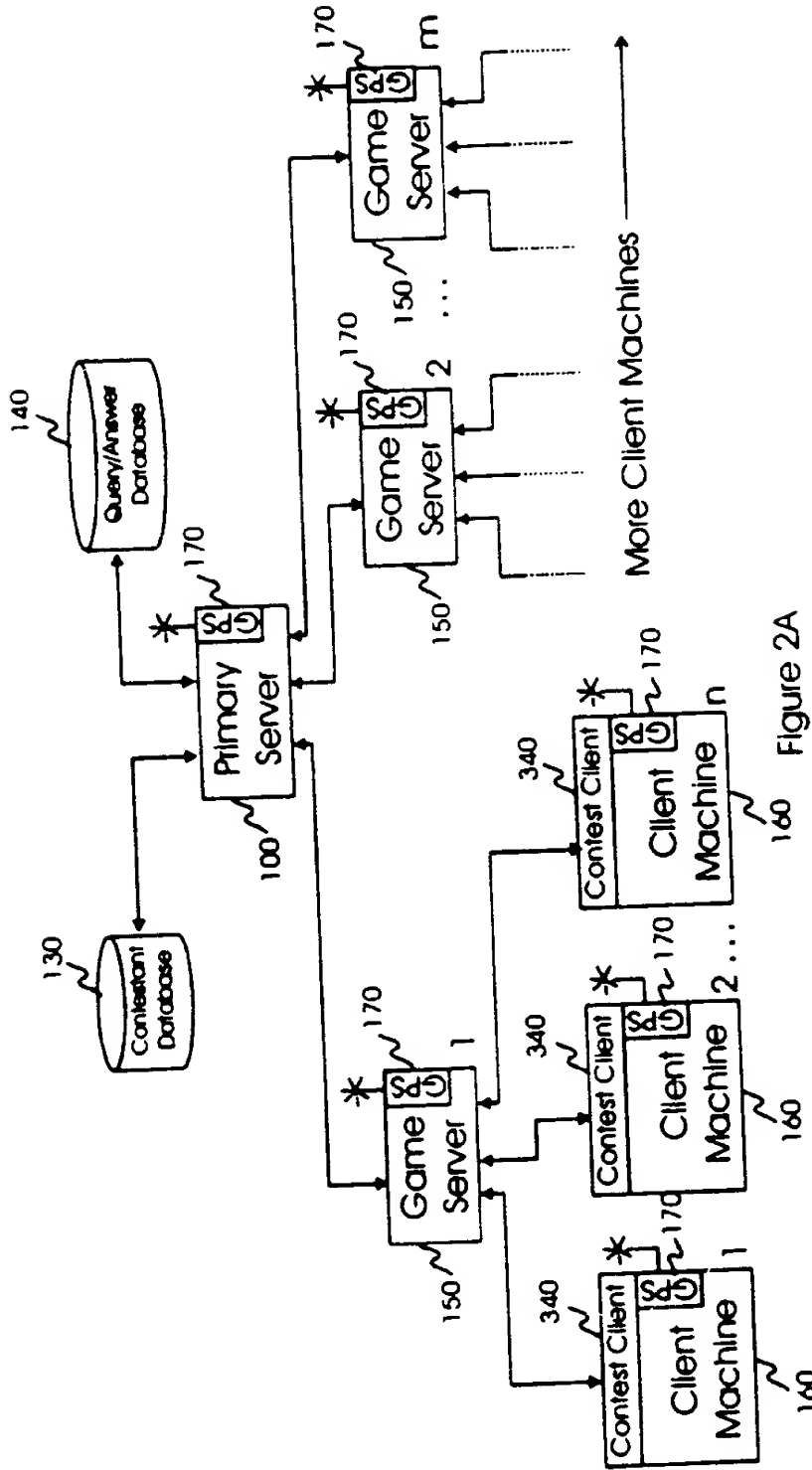


Figure 2A

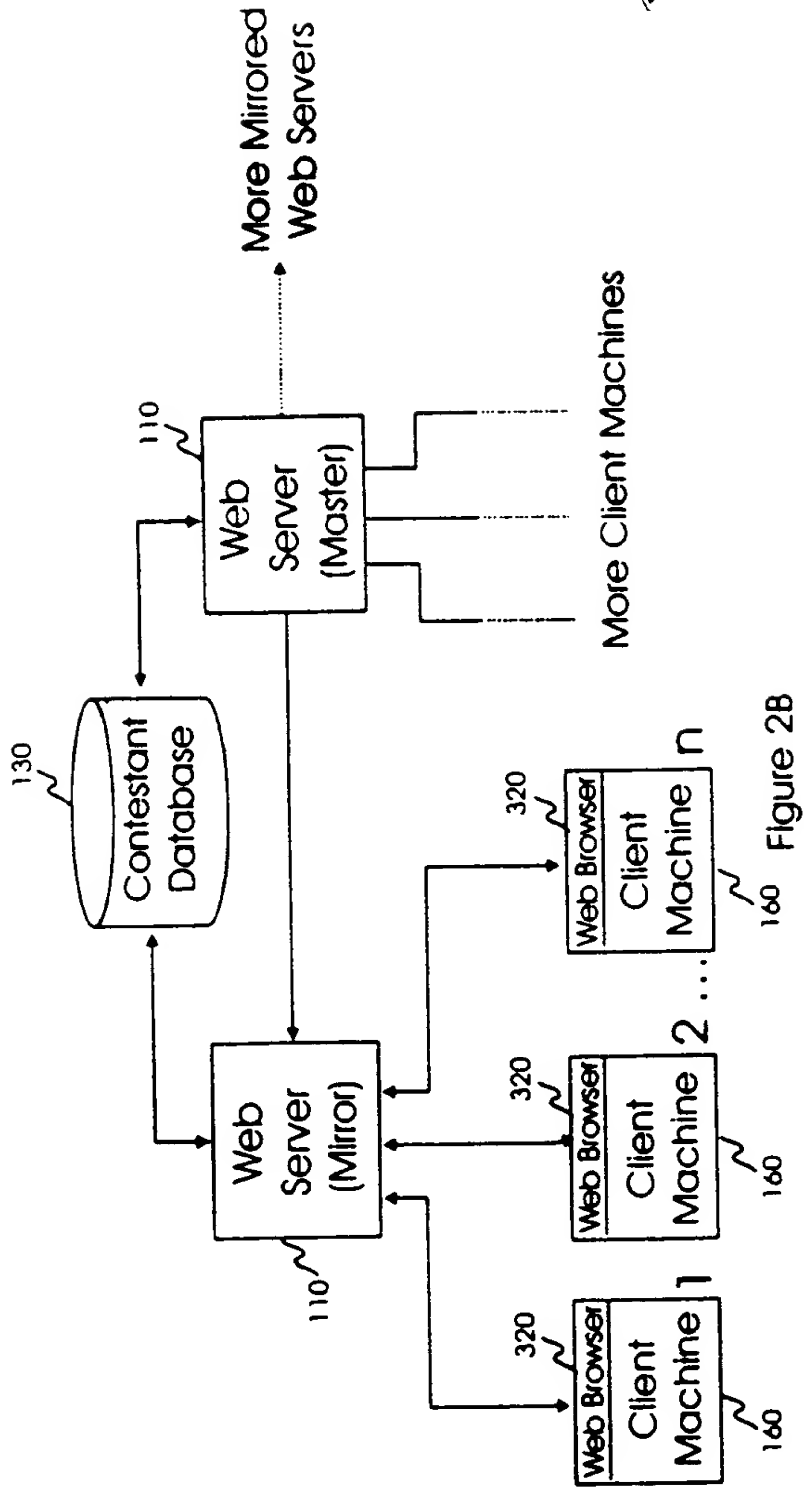


Figure 2B

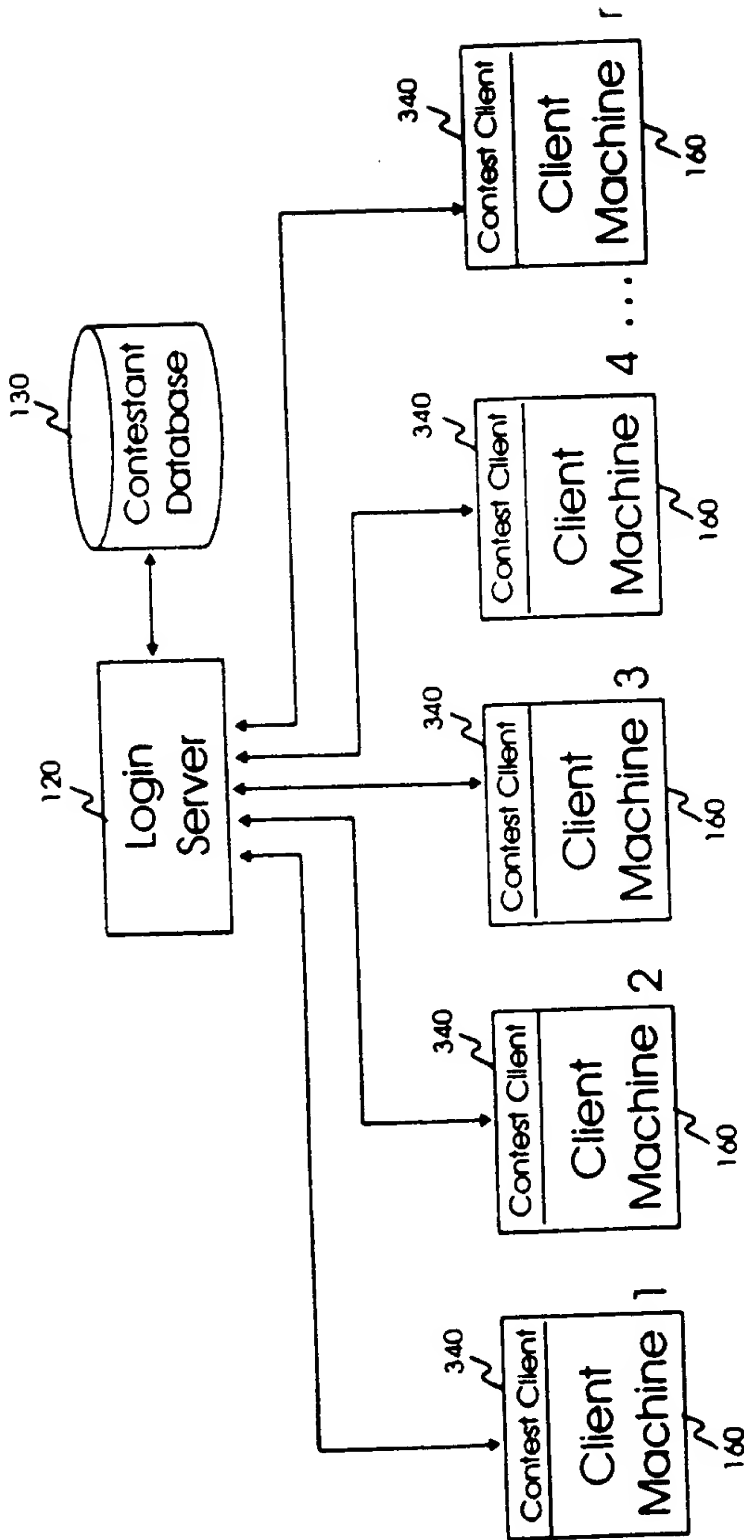


Figure 2C

# Client Machine 160

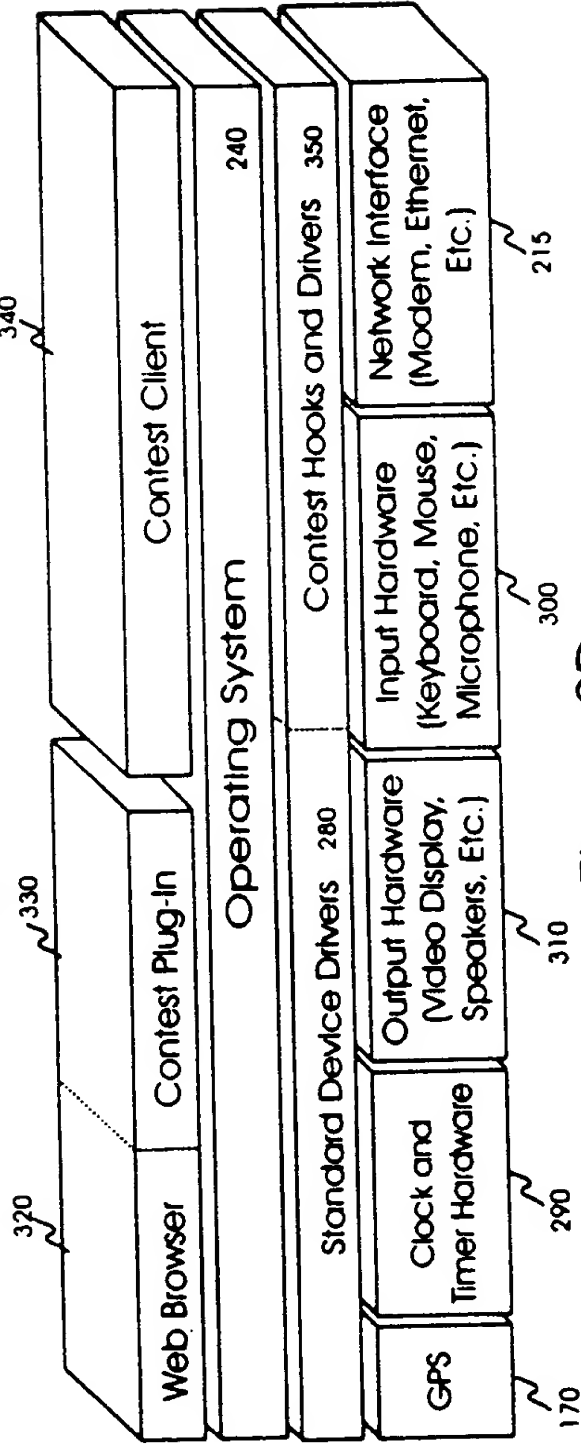


Figure 2D

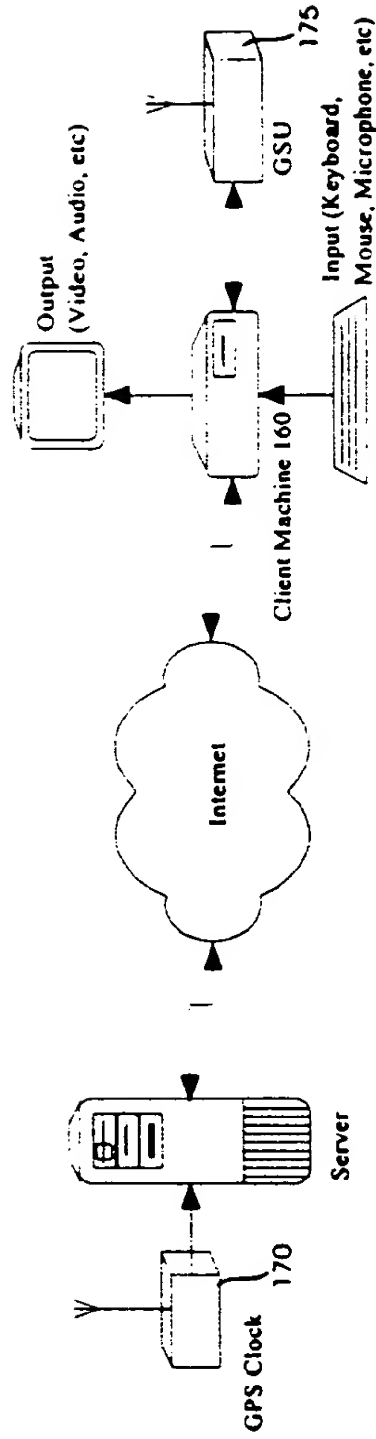


Figure 2D1

## Global Synchronization Unit 175

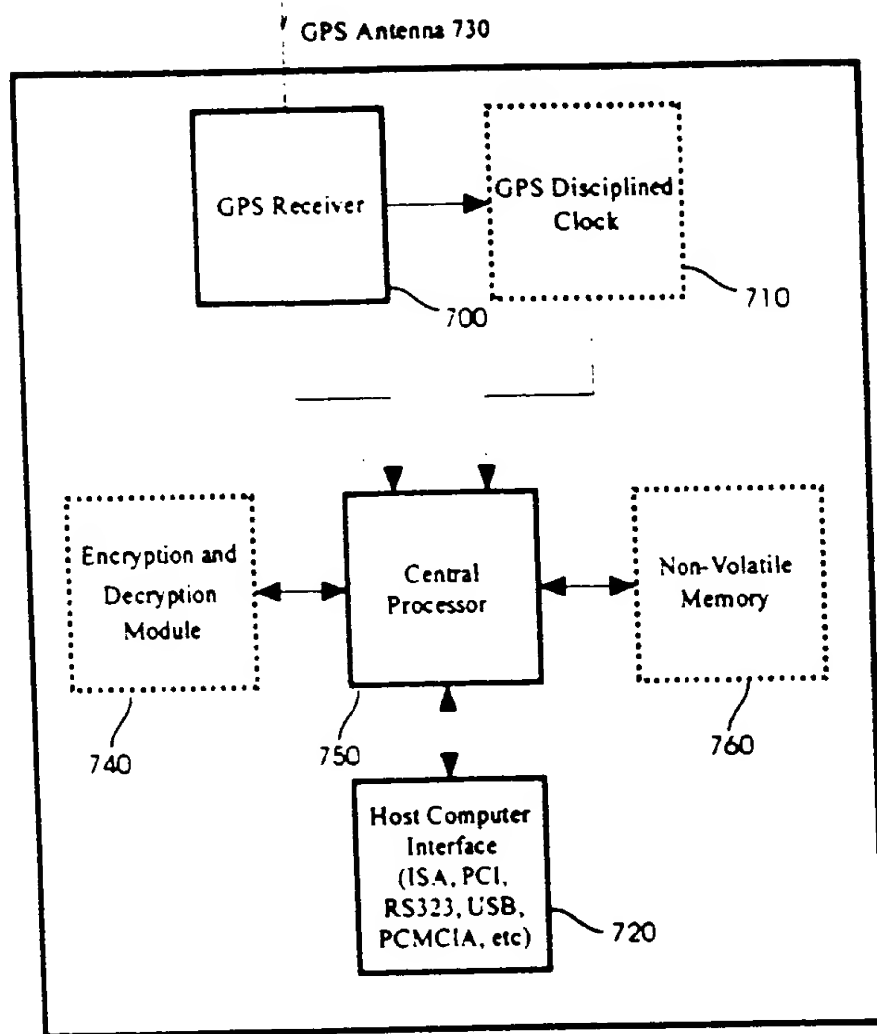


Figure 2D2



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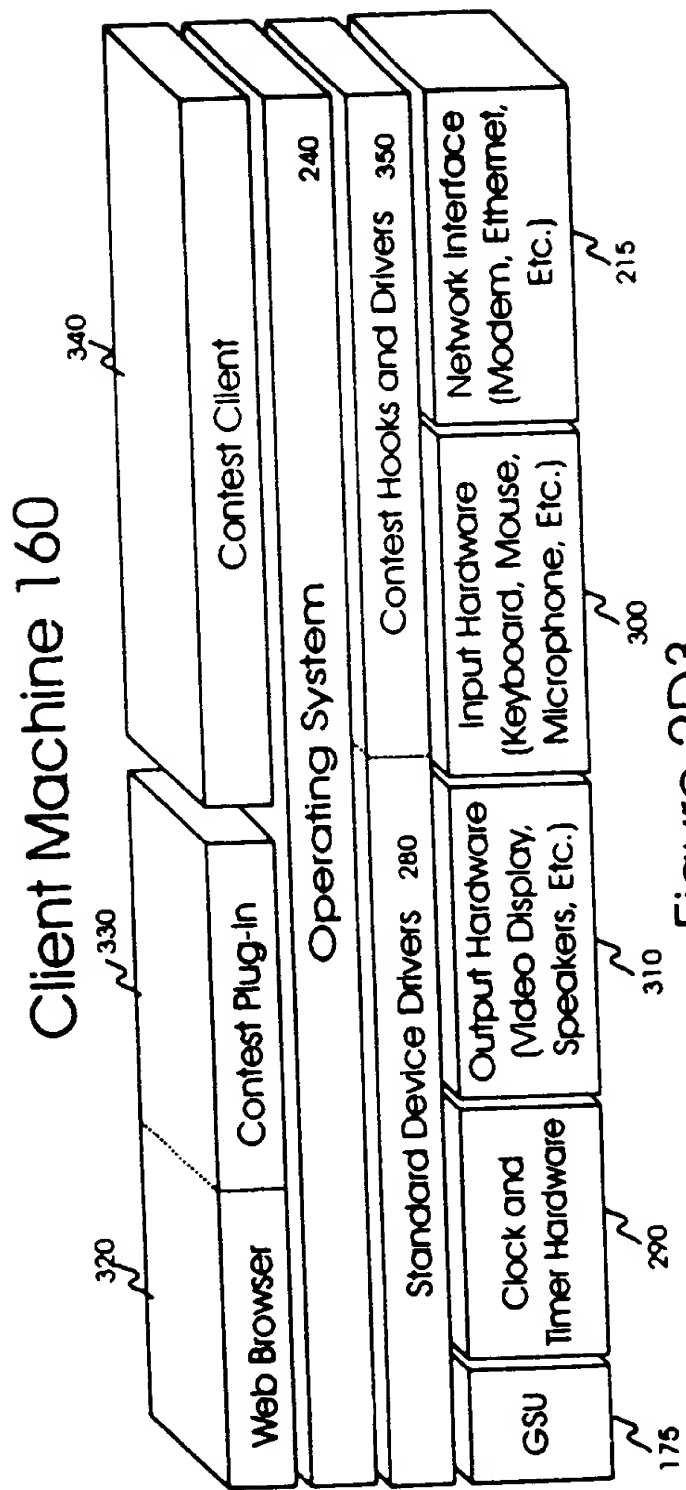


Figure 2D3

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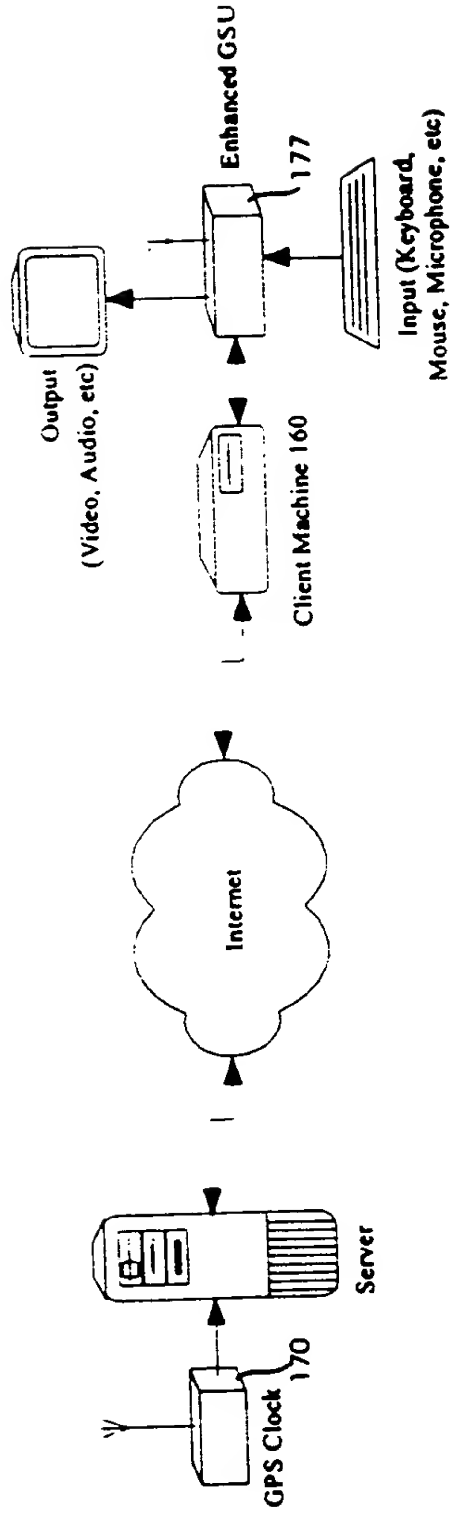


Figure 2D4

# Enhanced Global Synchronization Unit 177

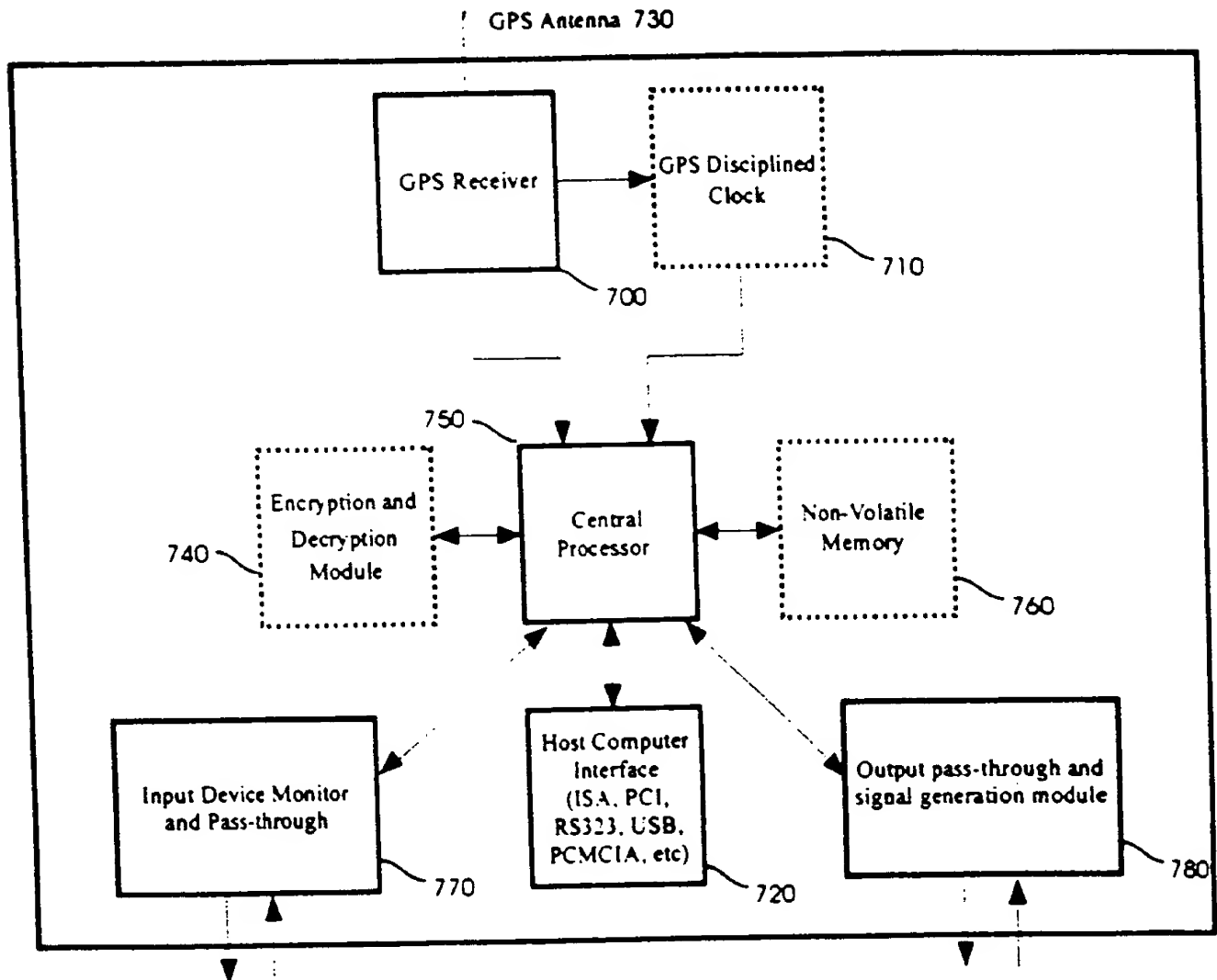


Figure 2D5

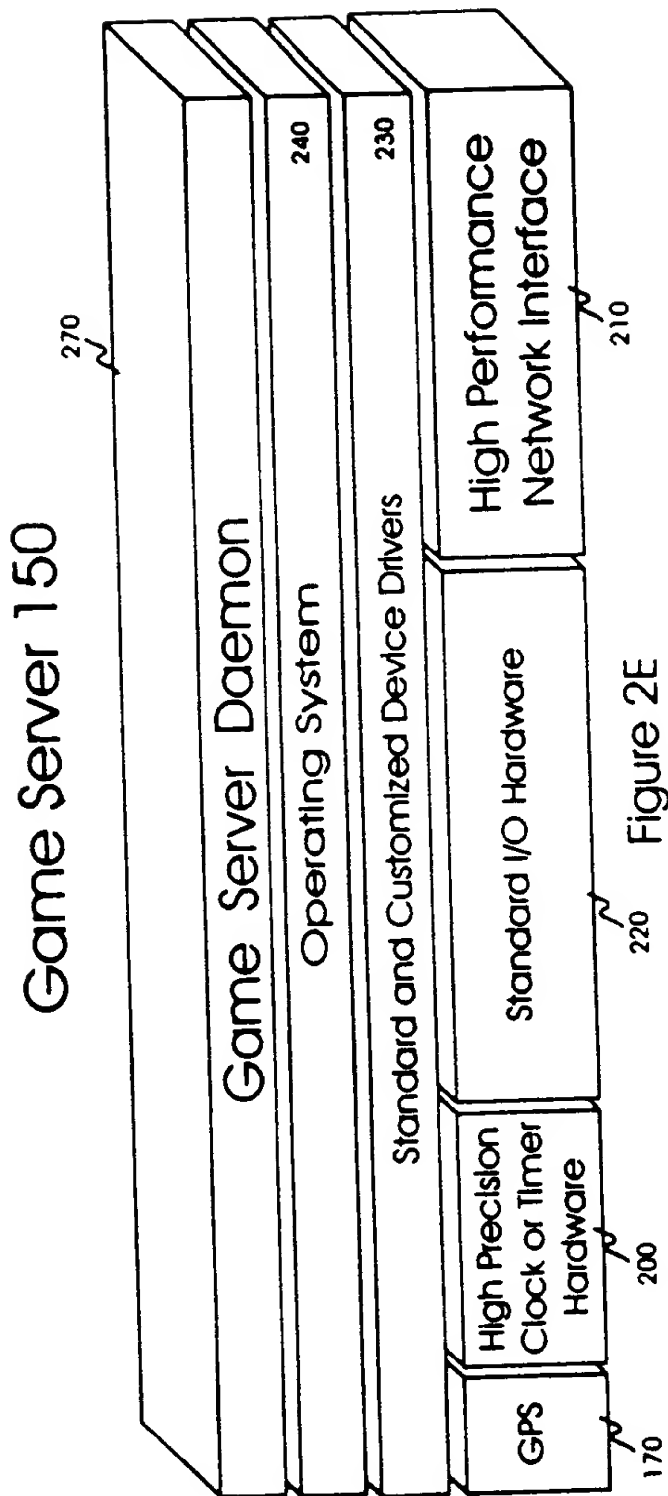


FIG. 2F is a block diagram of a web server 110, showing the various components that make up the web server. The web server 110 is shown as a stack of five layers, with the top layer being the web server software, followed by the operating system, standard device drivers, standard I/O hardware, and finally the high performance network interface at the bottom.

# Web Server 110

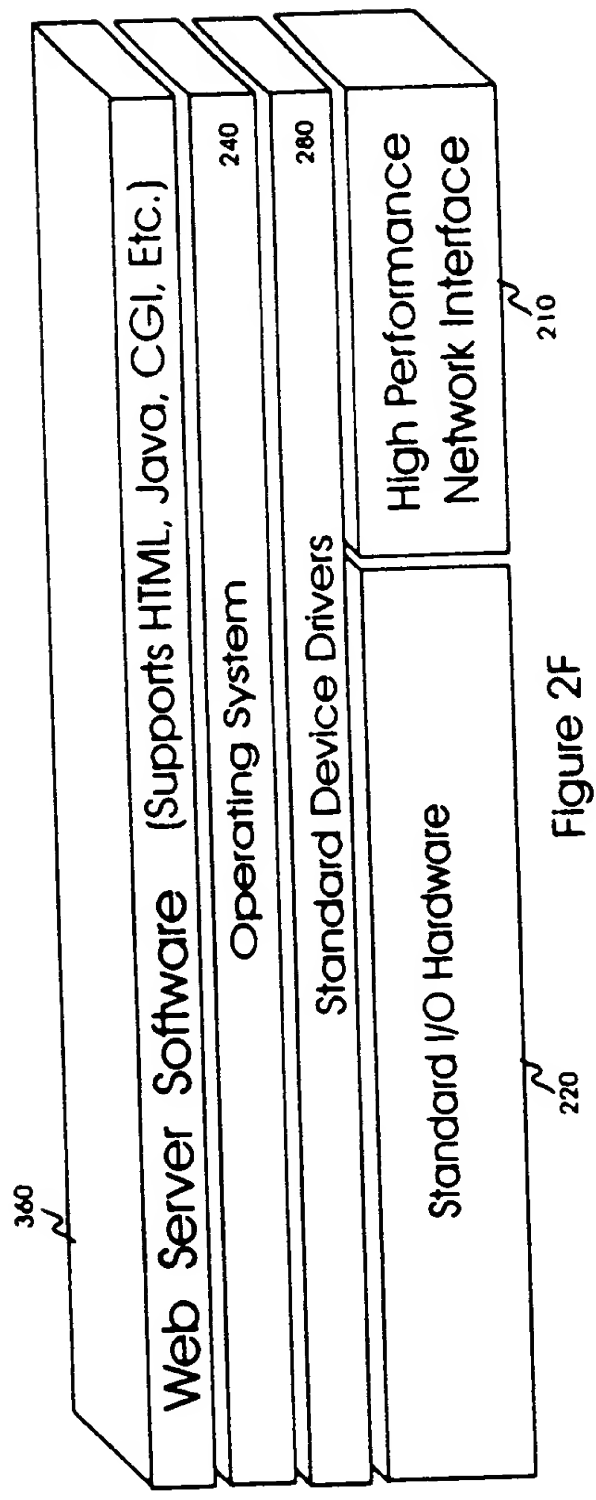
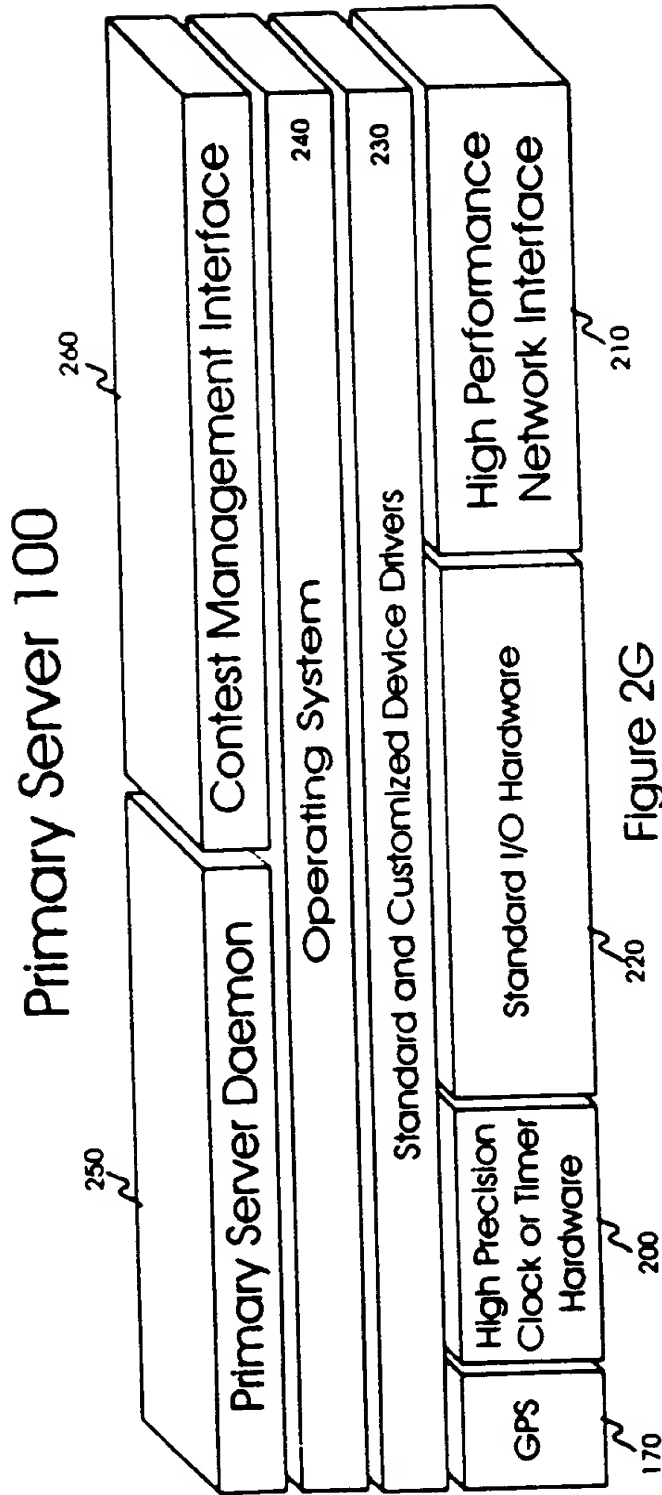
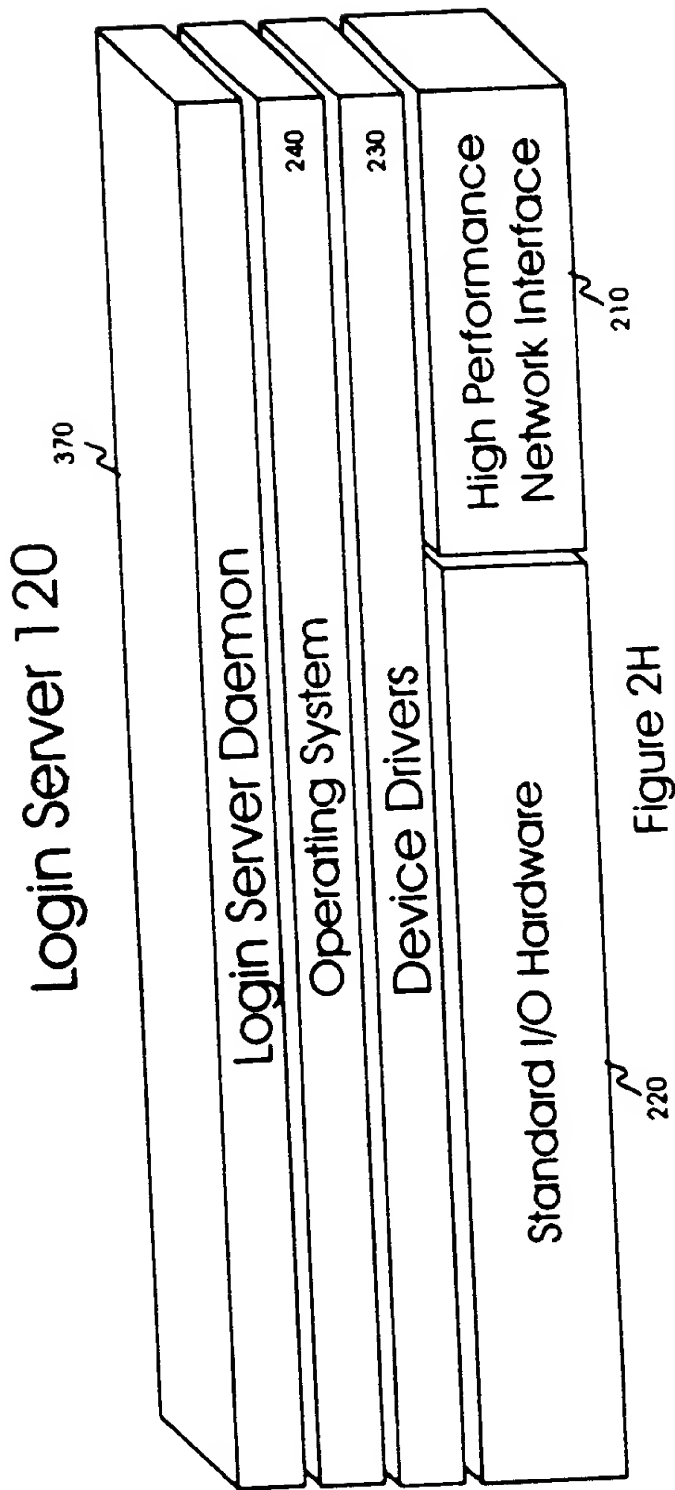


Figure 2F





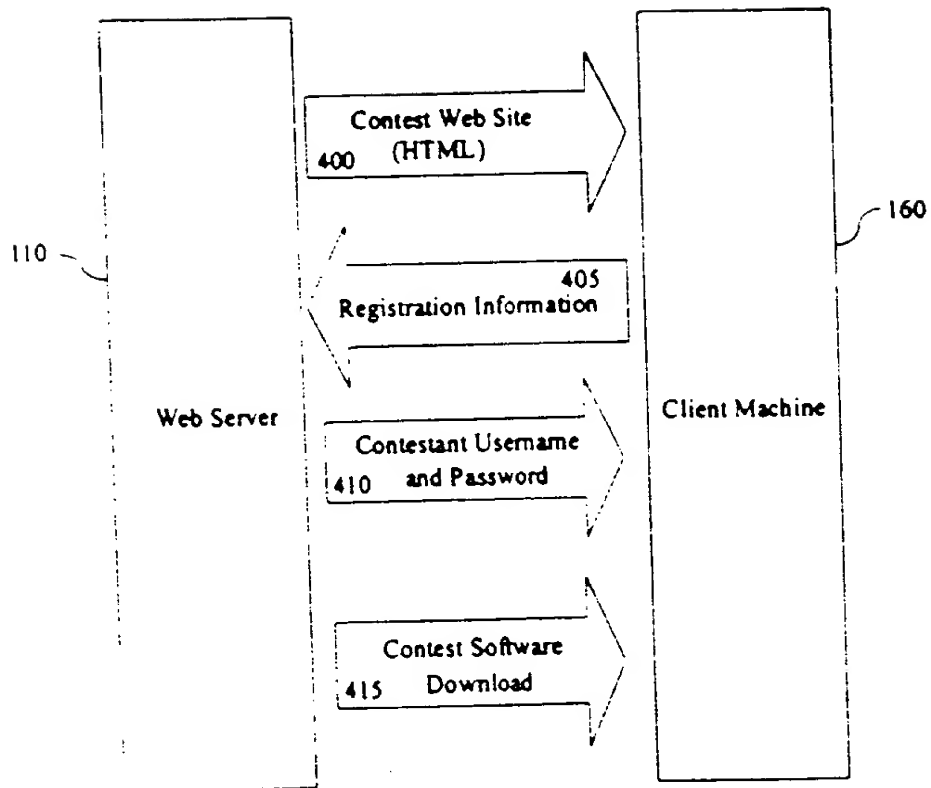


Figure 3A



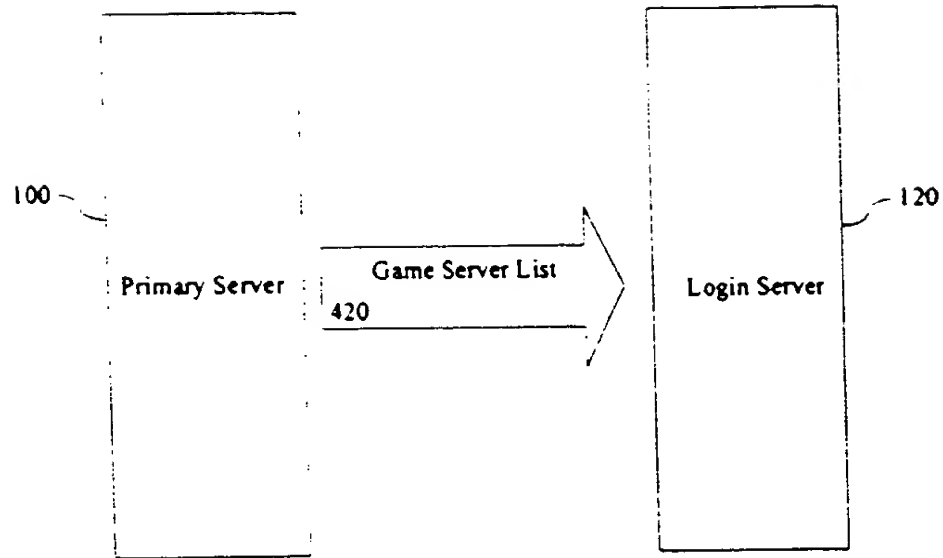


Figure 3B

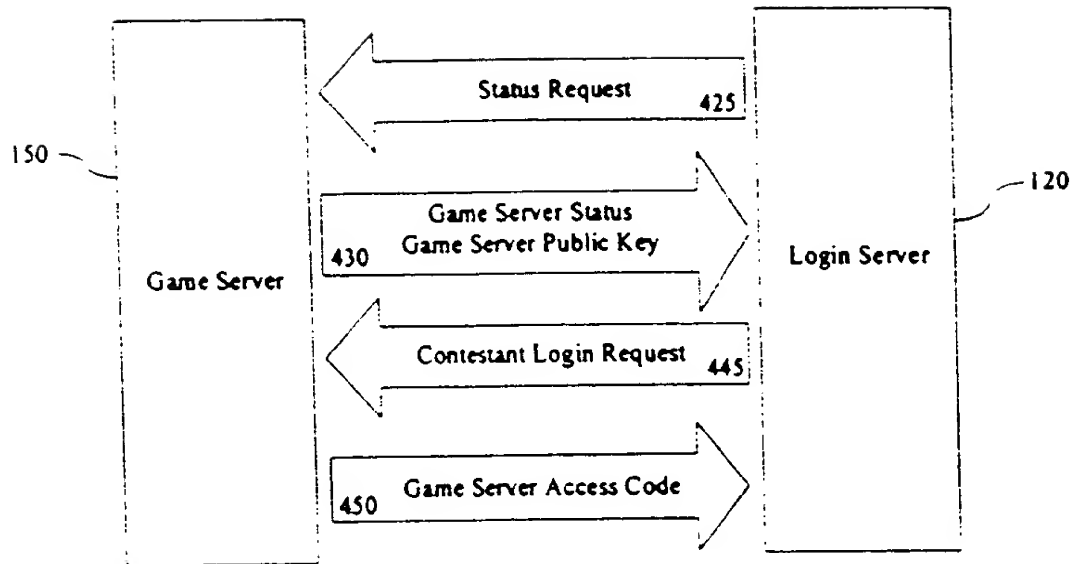


Figure 3C

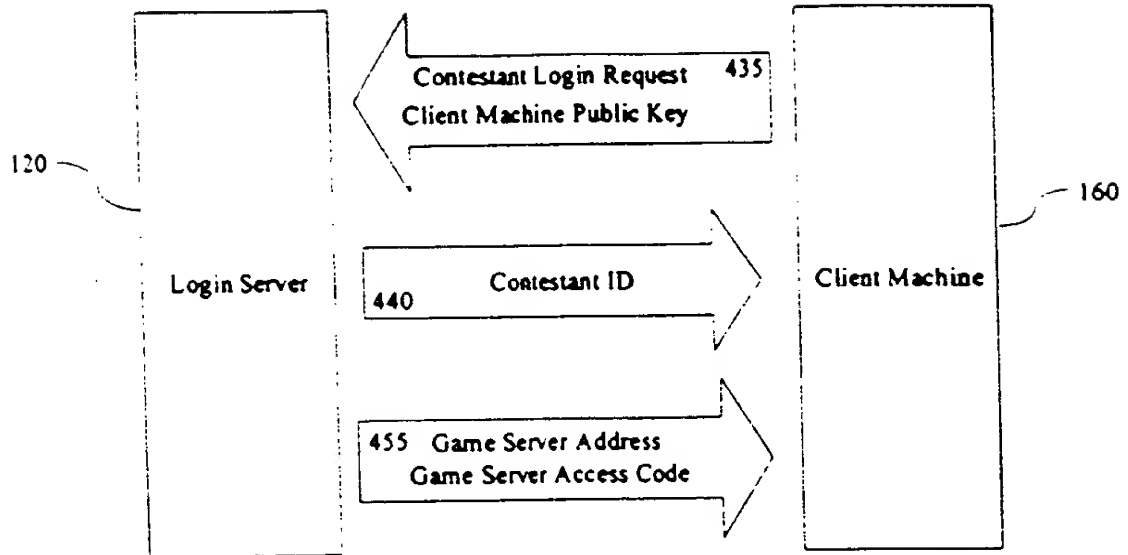


Figure 3D

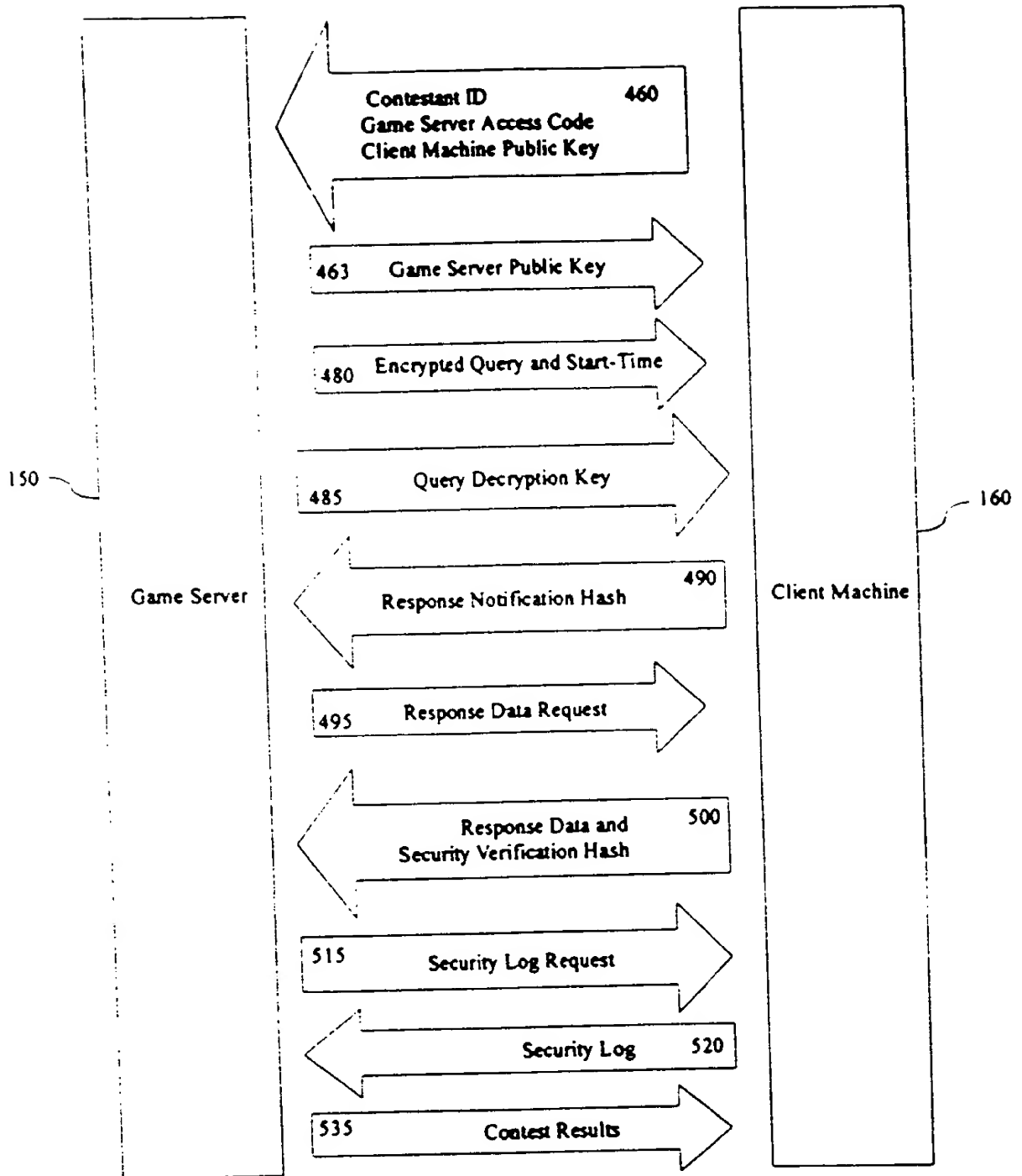


Figure 3E

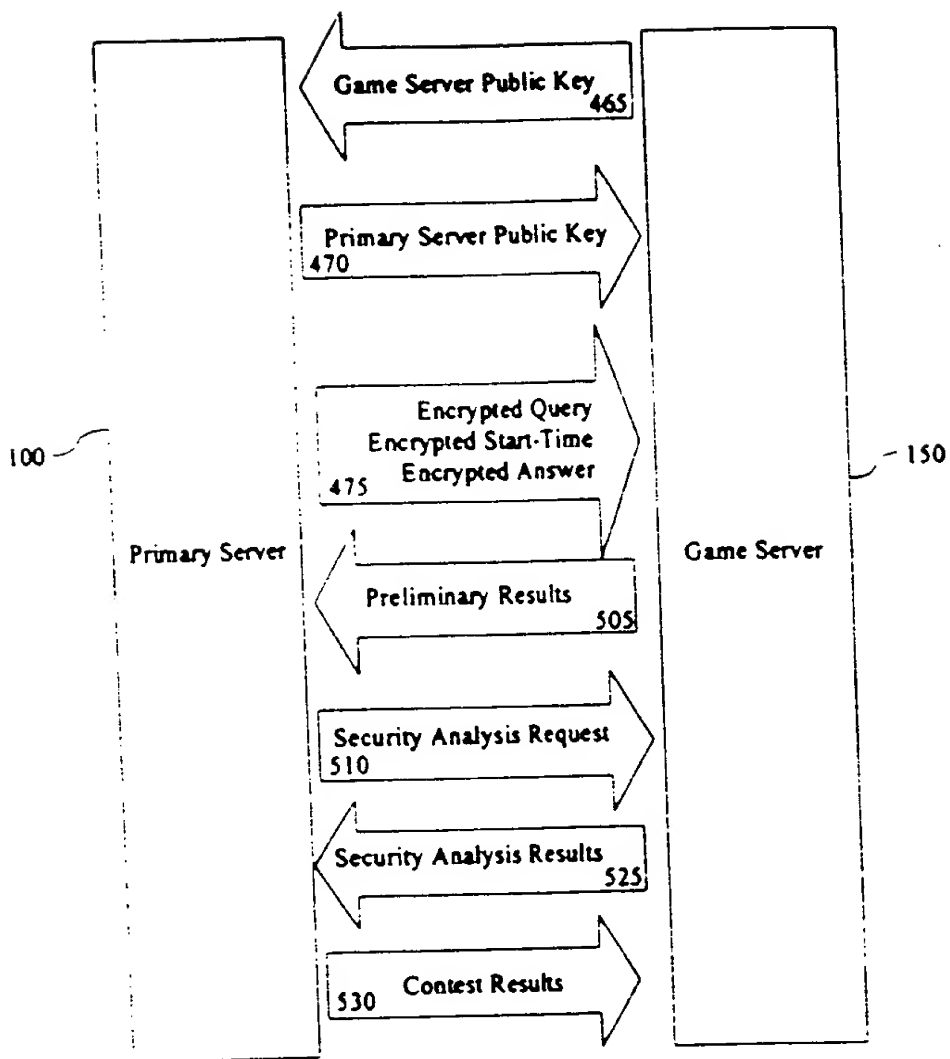


Figure 3F

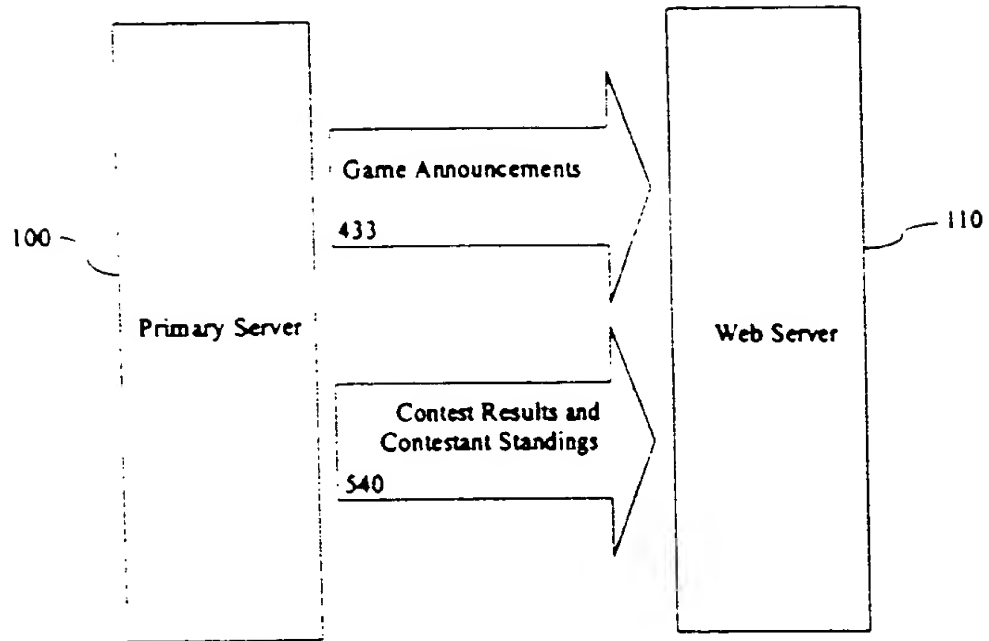


Figure 3G

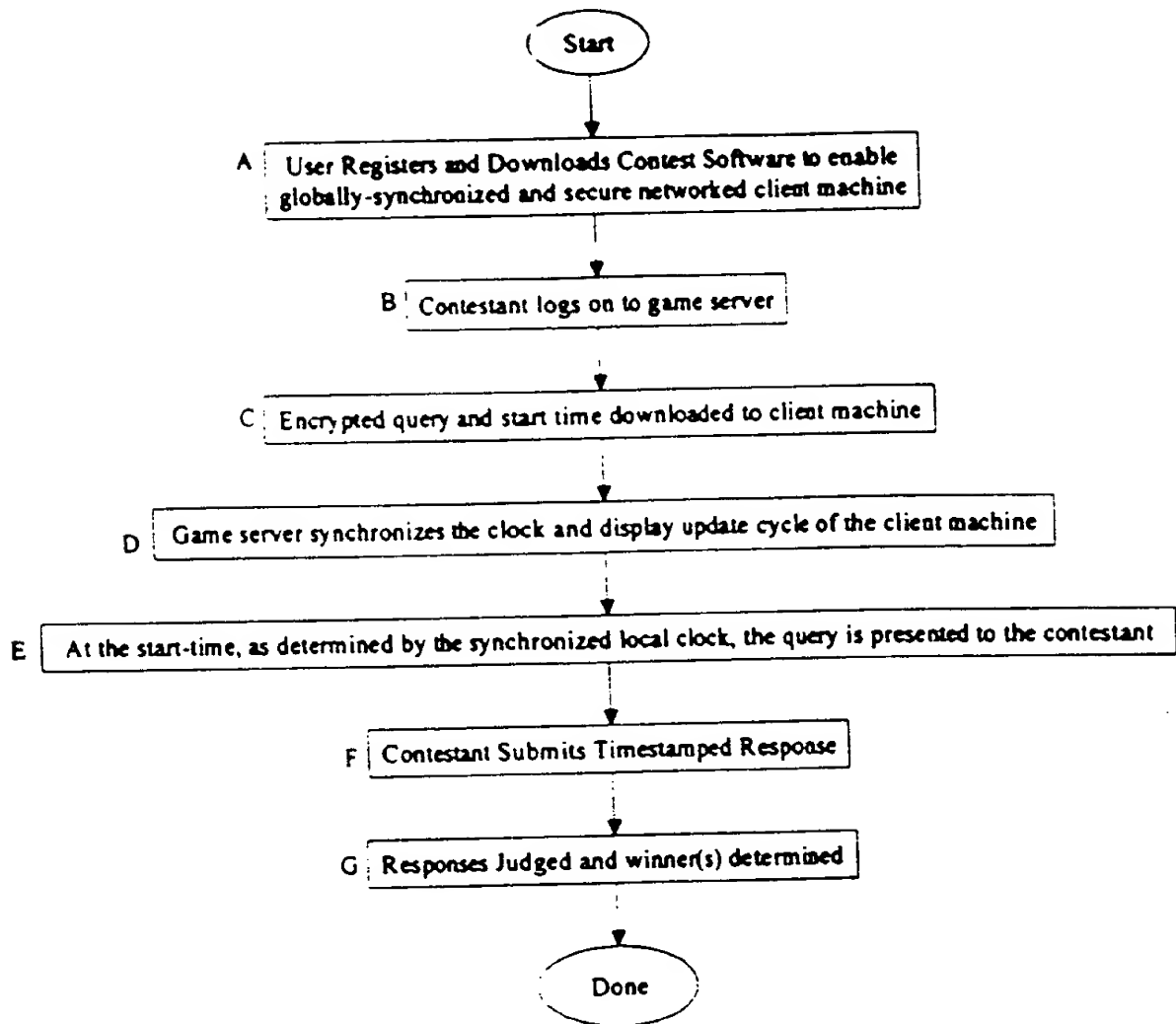


Figure 4

### User Registers and Downloads Contest Software

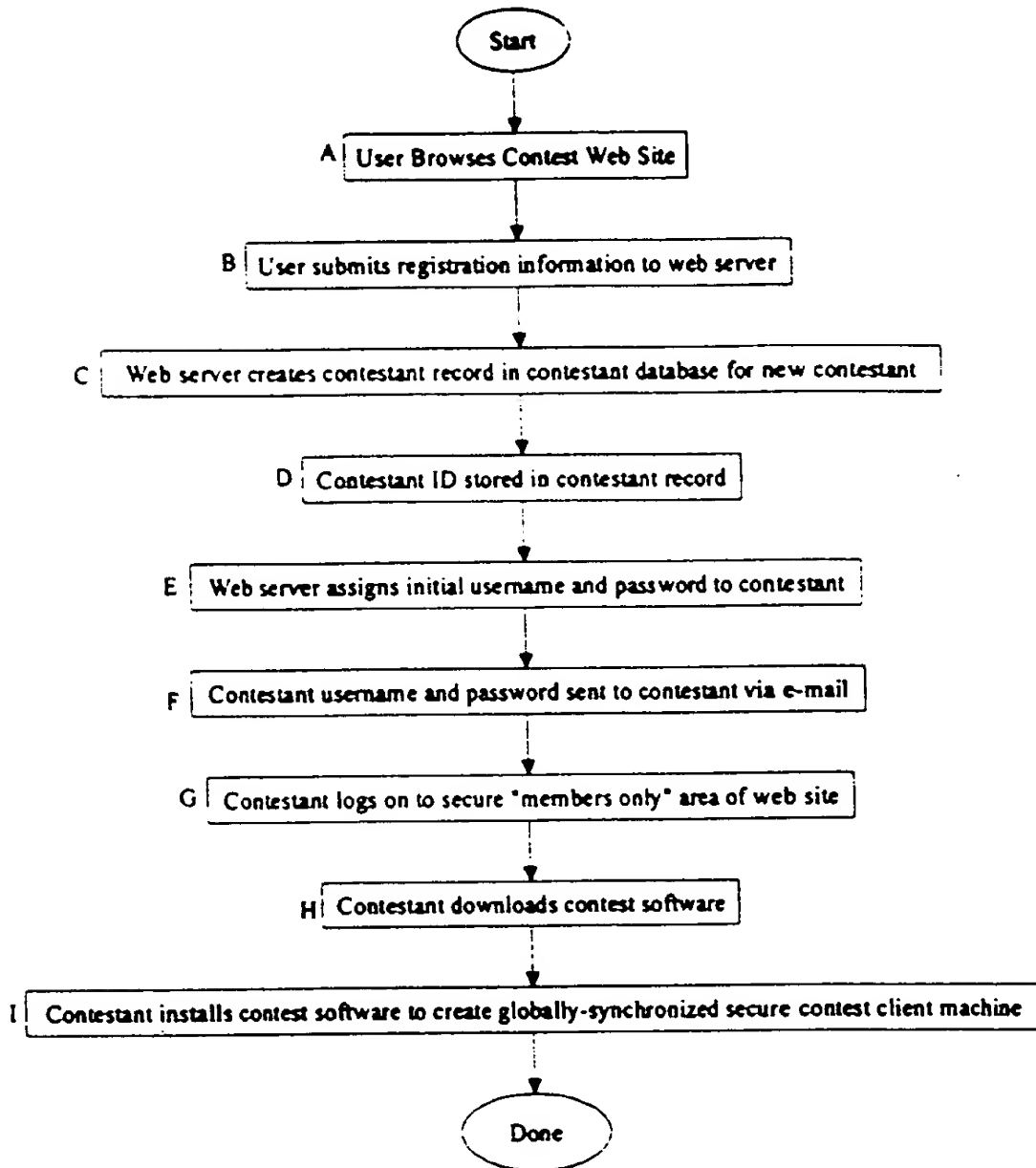


Figure 4A



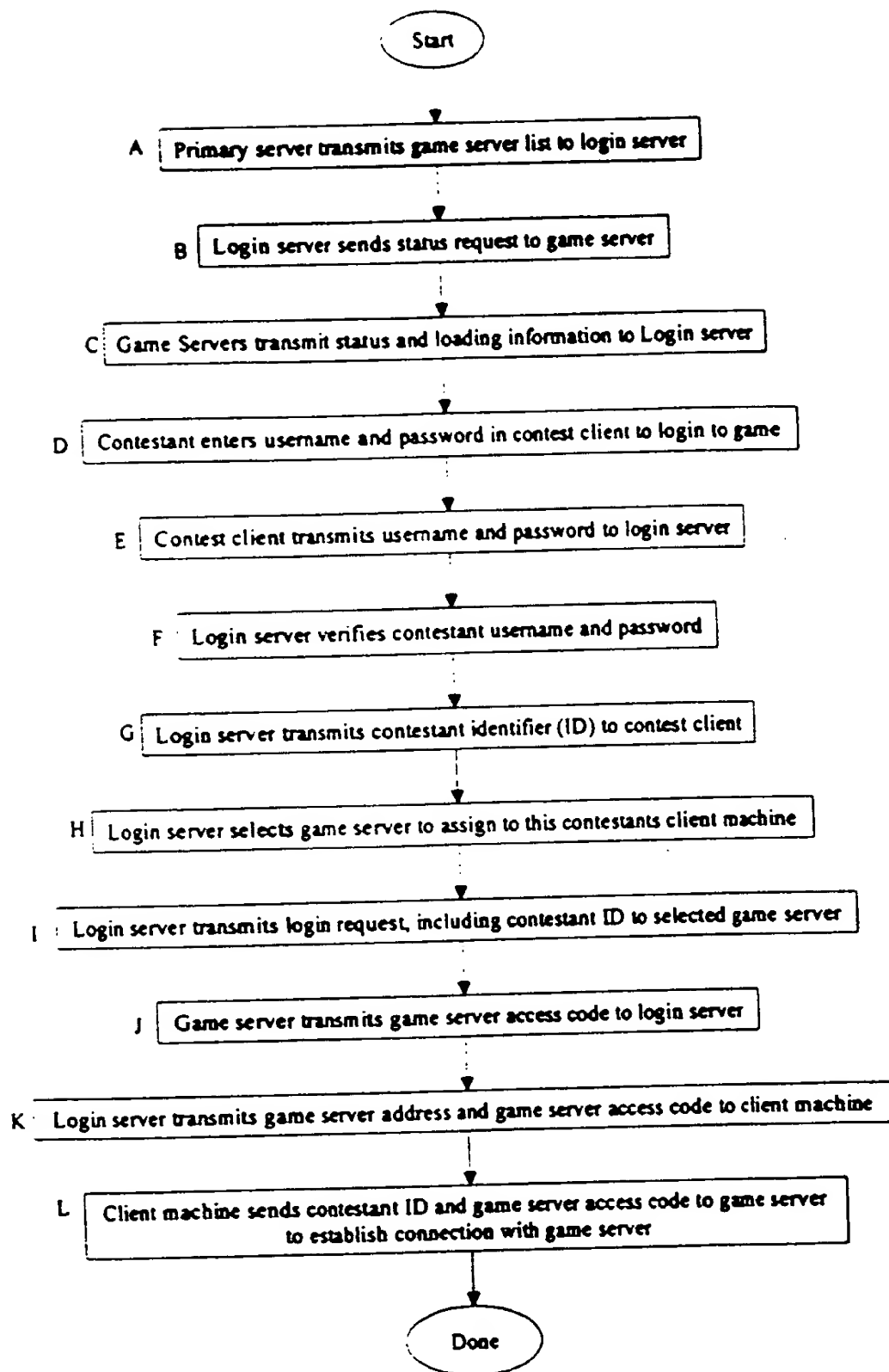


Figure 4B

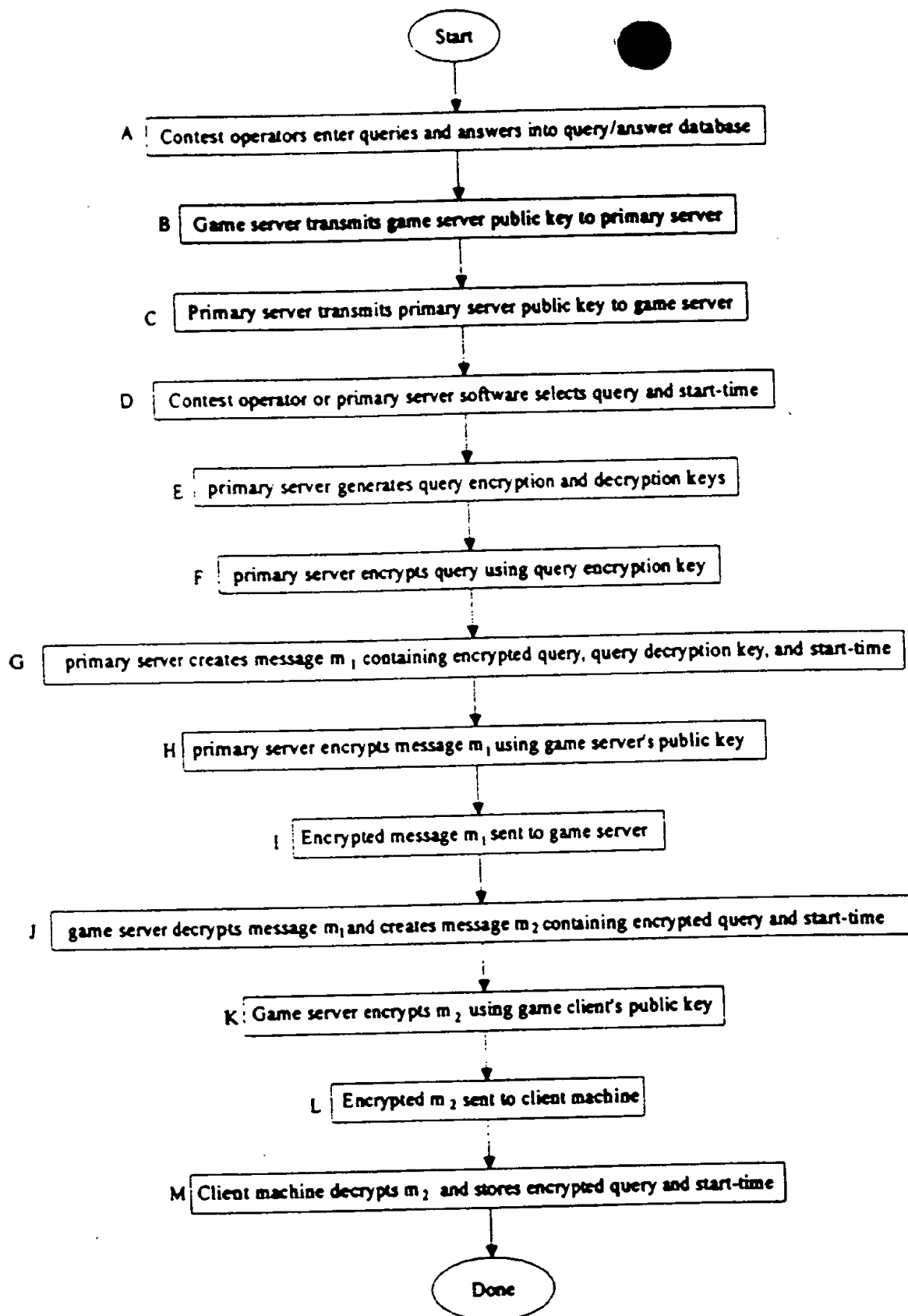


Figure 4C

Client machine clock characterized and display update cycle synchronized with global clock  
(Client Machine With Basic GSU)

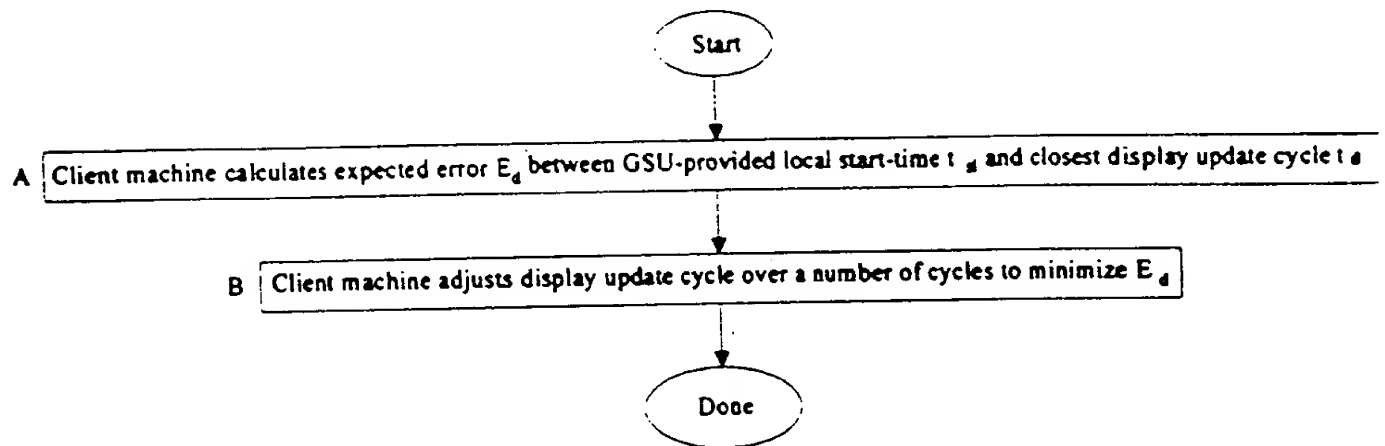


Figure 4D1

Client machine clock characterized and display update cycle synchronized with global clock  
(Client Machine With Enhanced GSU)

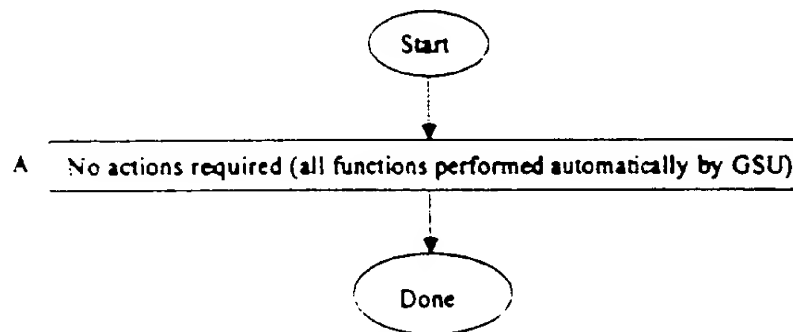


Figure 4D2

# Client machine clock characterized and display update cycle synchronized with global clock

(Client Machine Without GSU)

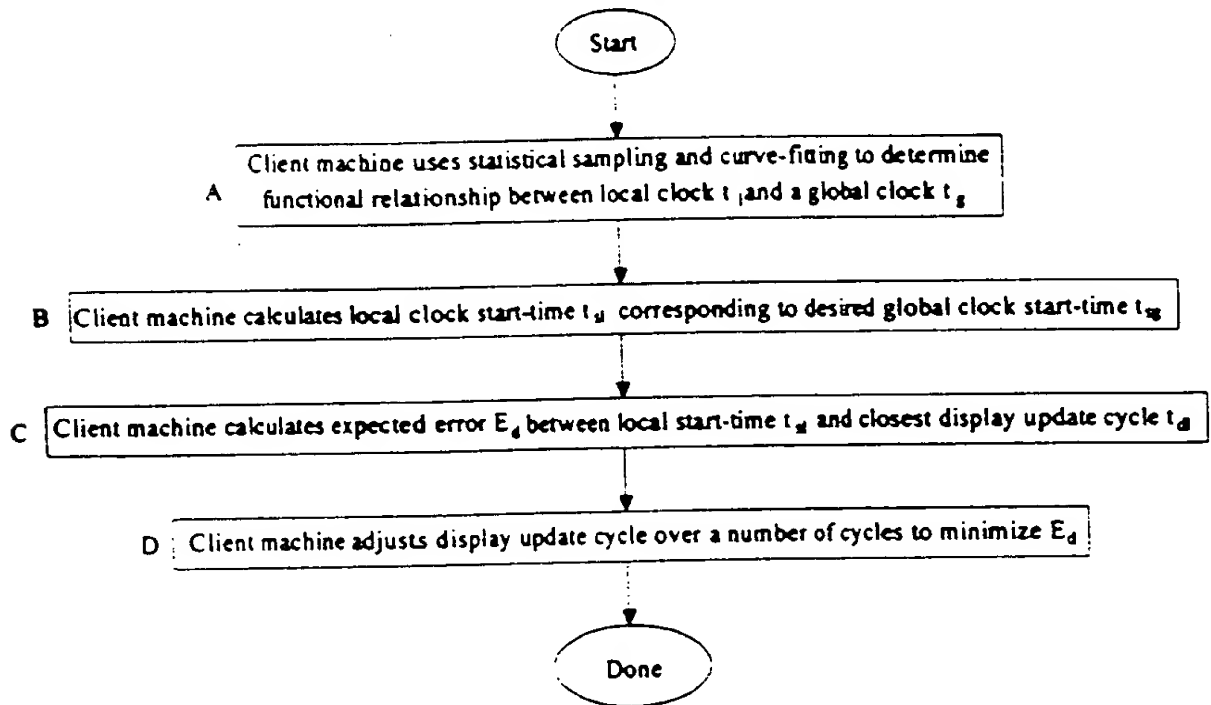


Figure 4D3

At start-time, the query is presented to the contestant

(Client Machine With Basic GSU)

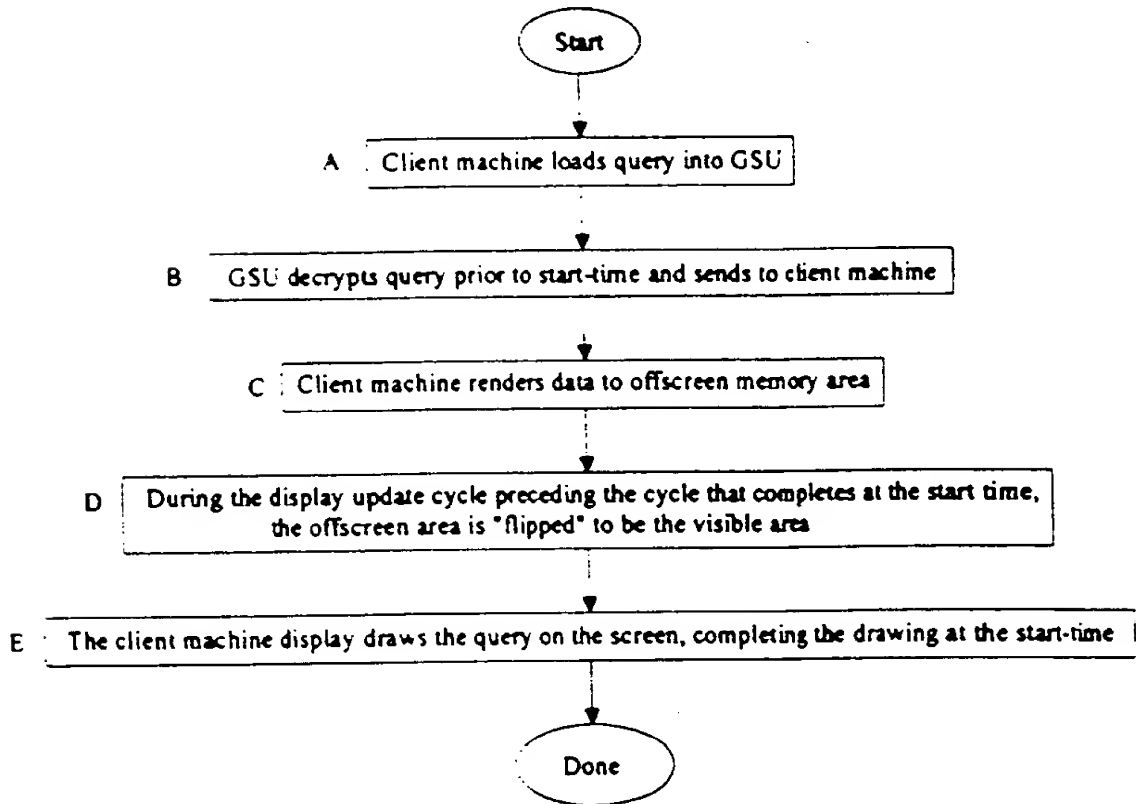


Figure 4E1

At start-time, the query is presented to the contestant

(Client Machine With Enhanced GSU)

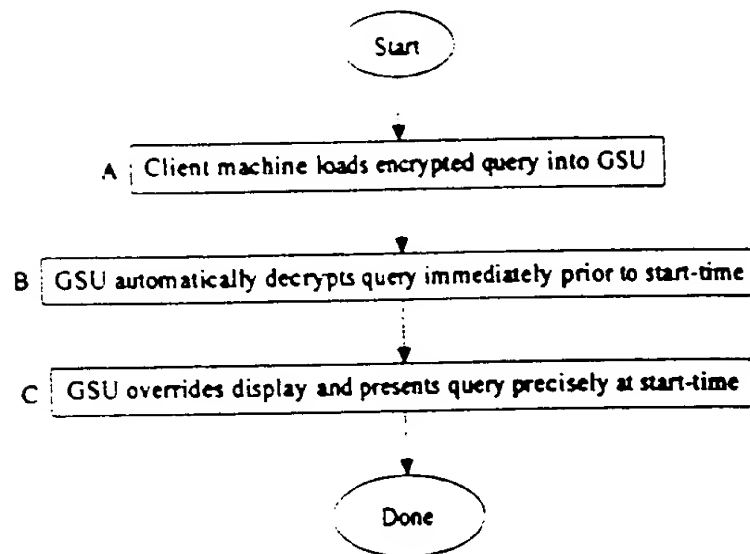


Figure 4E2

At start-time, the query is presented to the contestant

(Client Machine Without GSU)

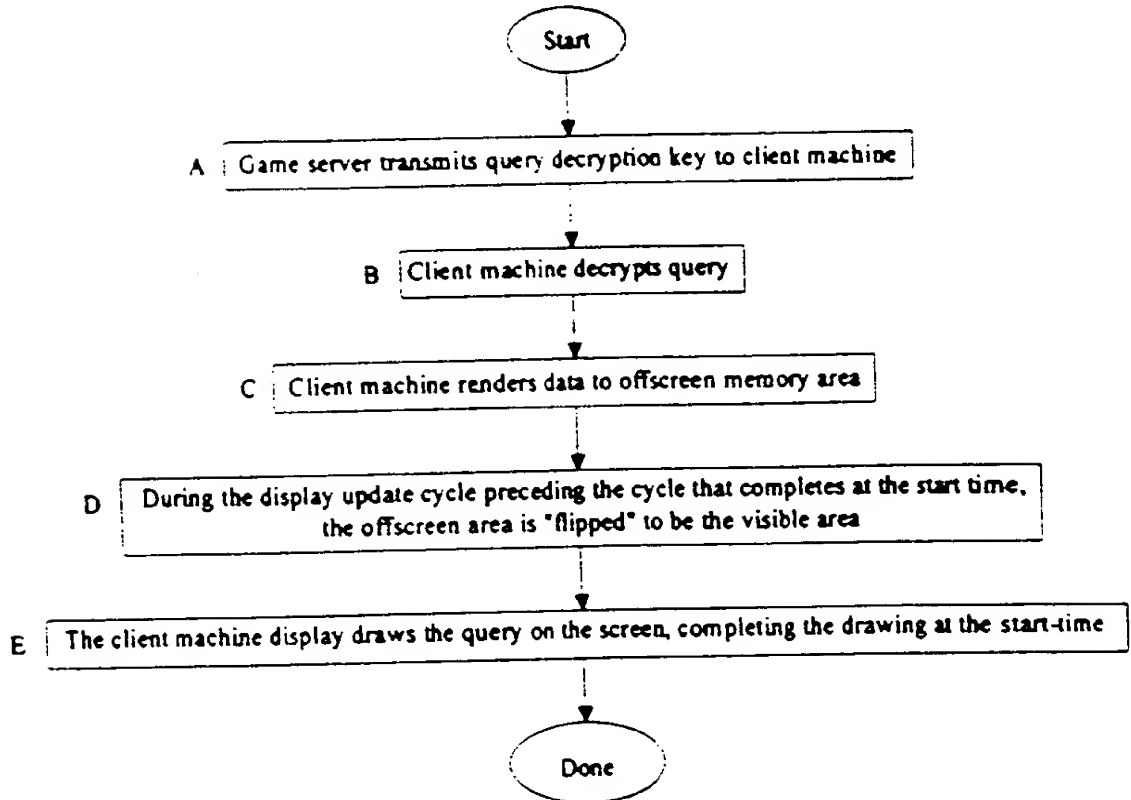


Figure 4E3



### Contestant submits timestamped response

(Client Machine With Basic GSU)

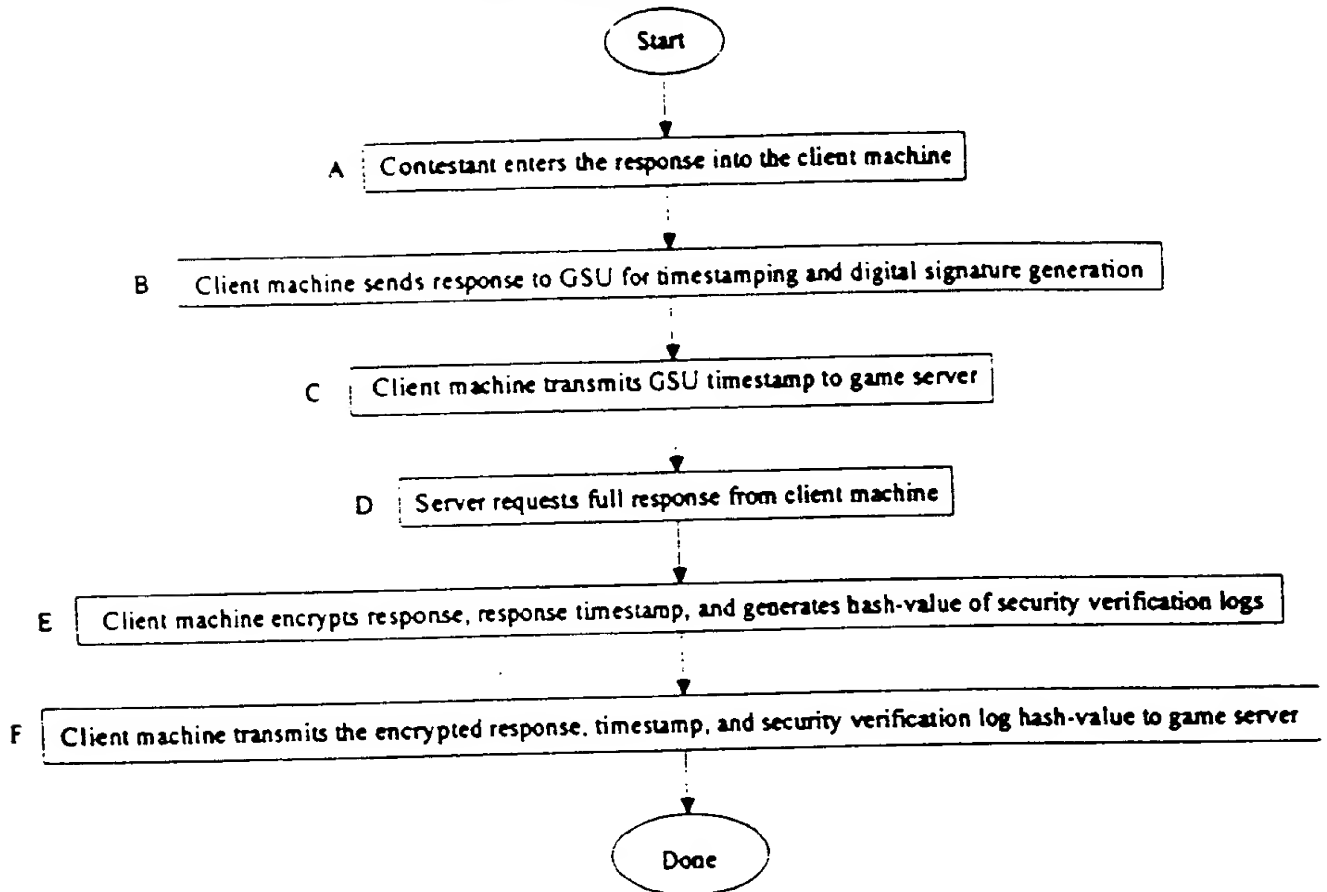


Figure 4F1

### Contestant submits timestamped response

(Client Machine With Enhanced GSU)

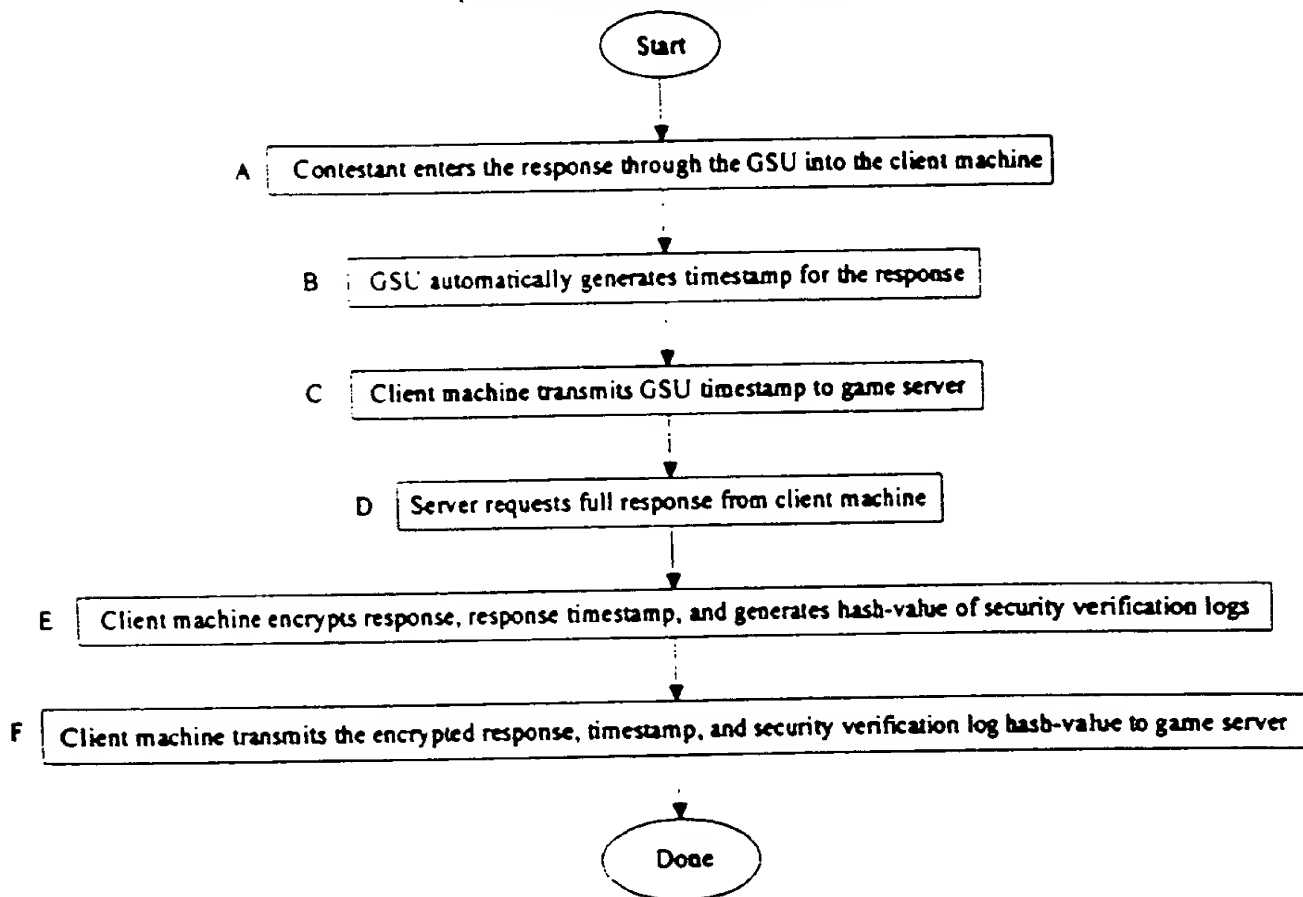


Figure 4F2

### Contestant submits timestamped response

(Client Machine Without GSU)

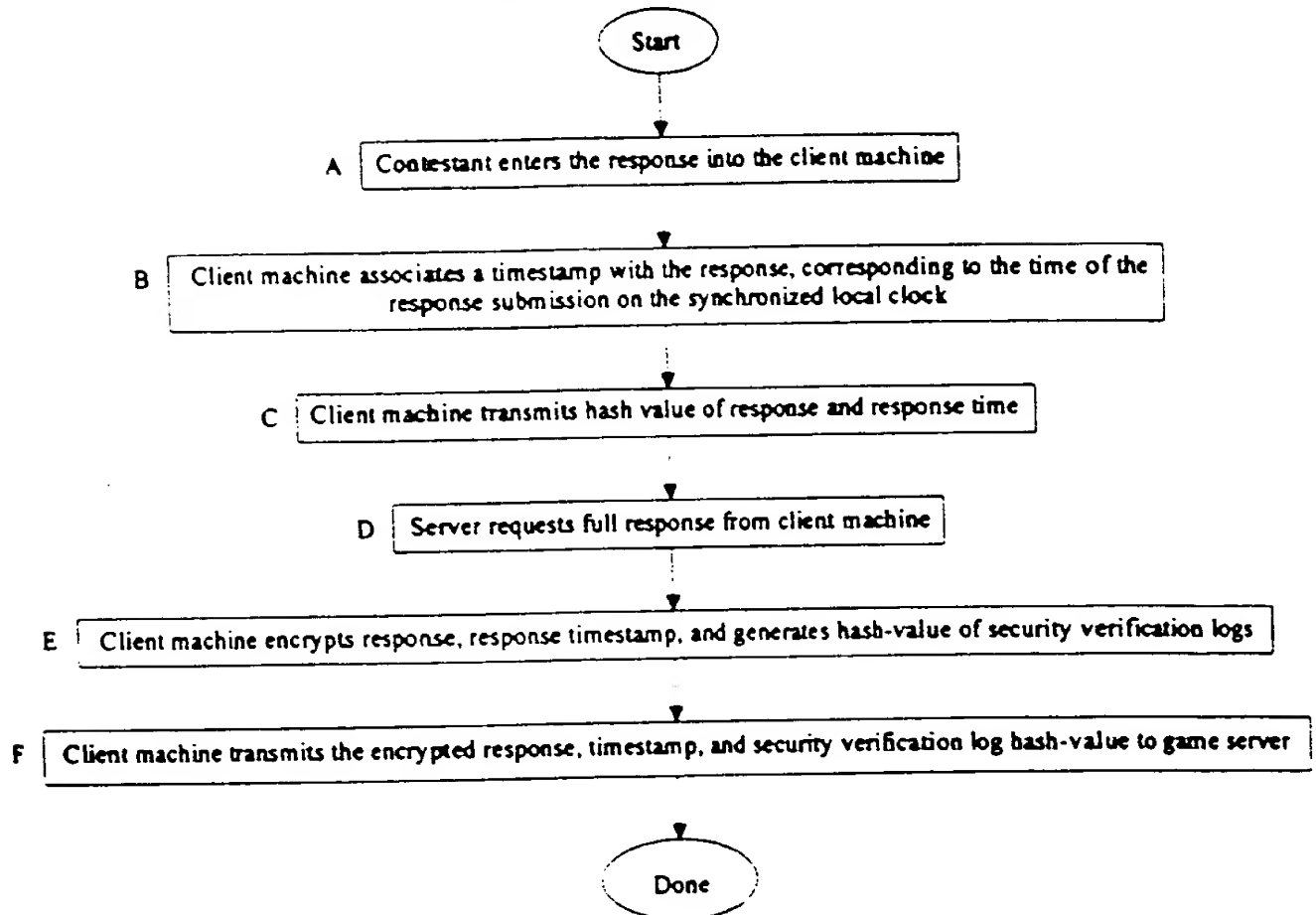


Figure 4F3

## Responses Judged and Winners Determined

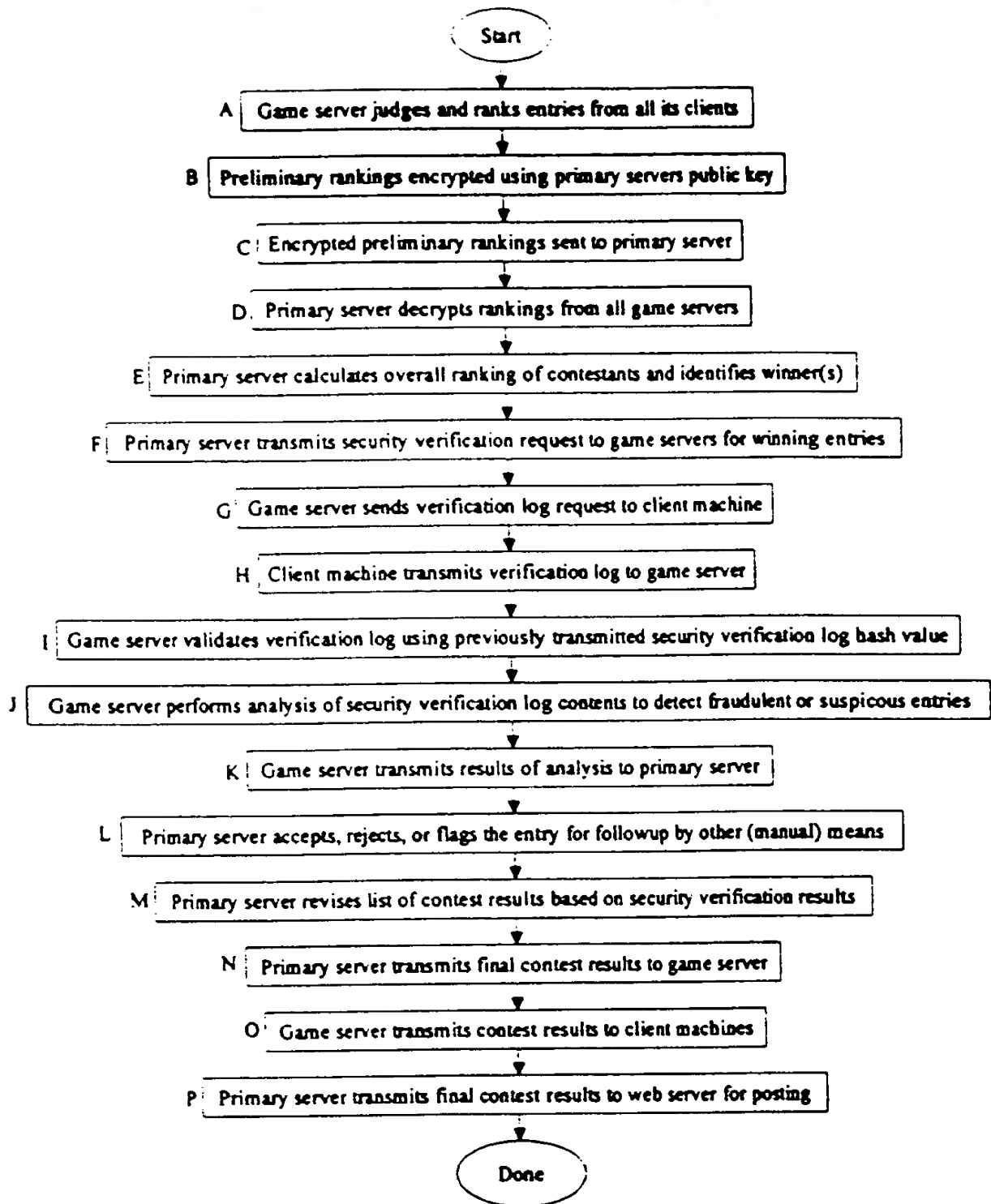


Figure 4G

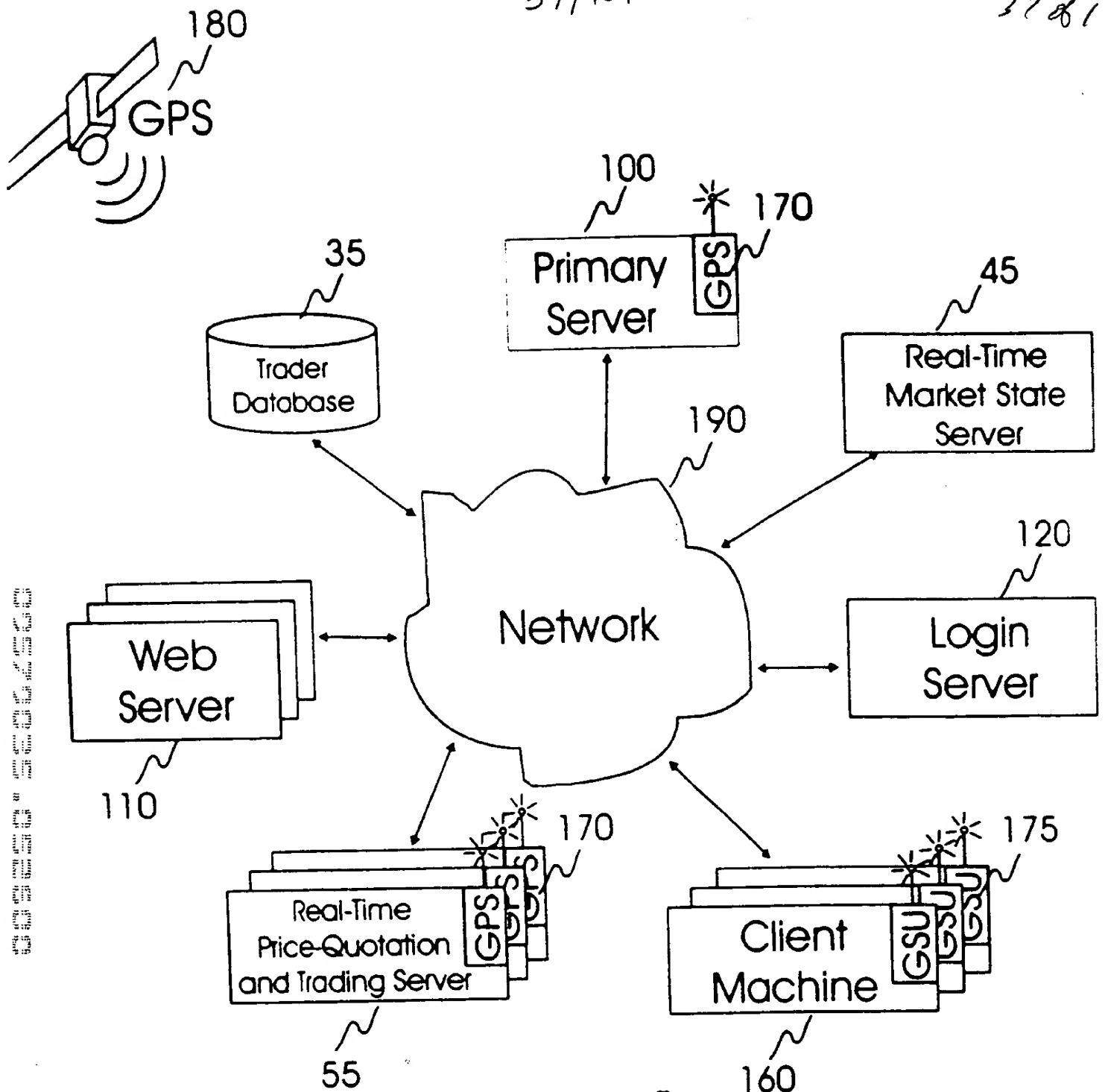


Figure 5

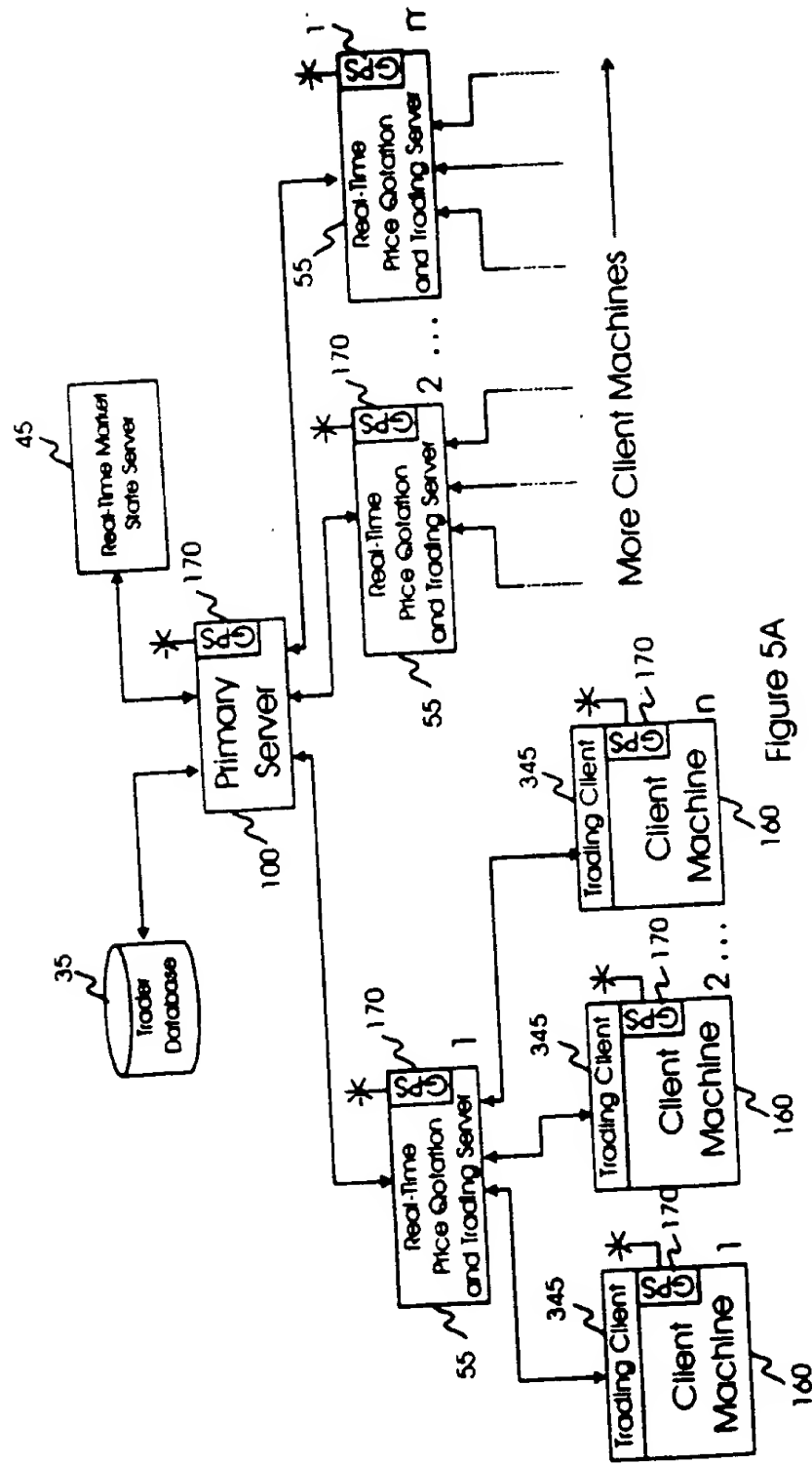


Figure 5A

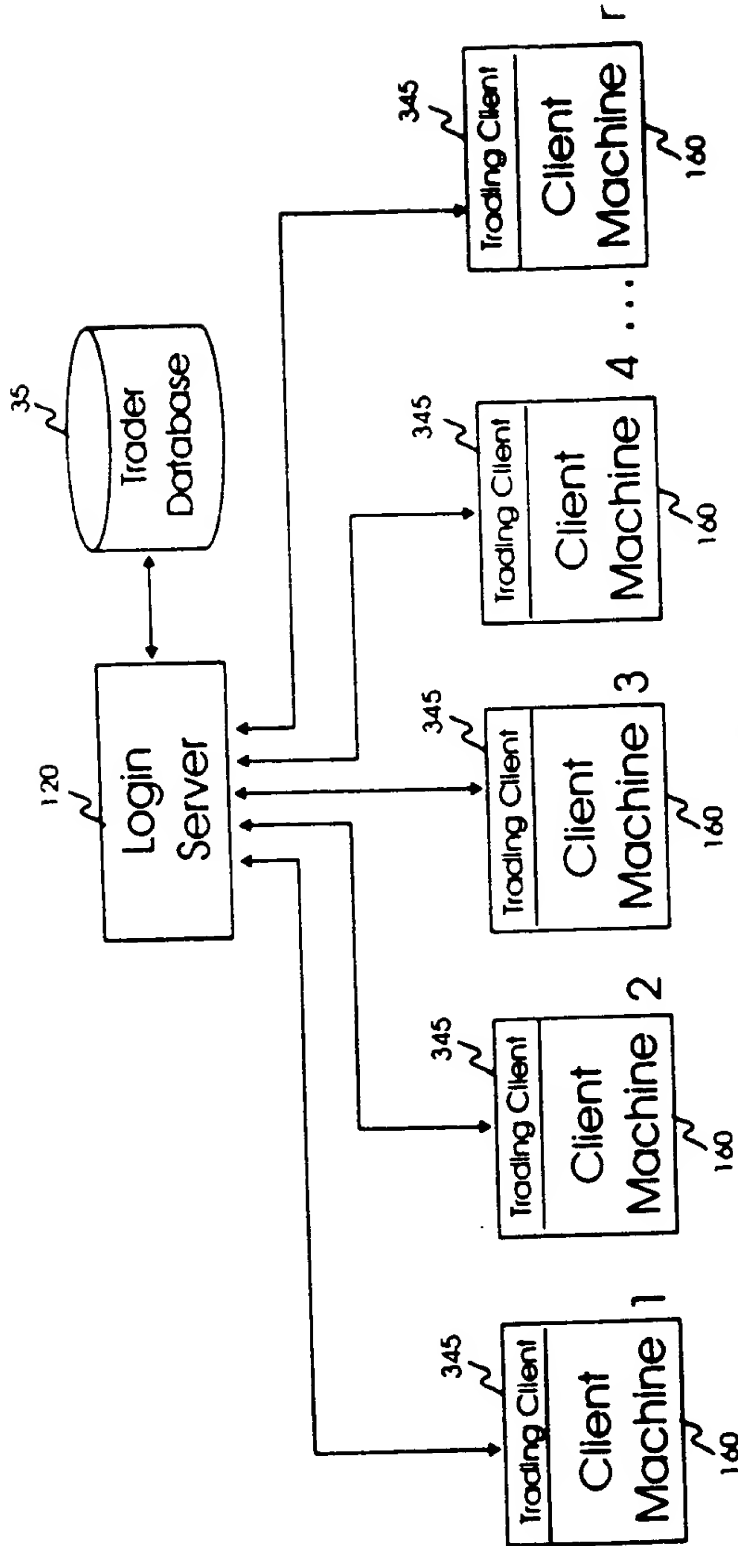


Figure 5B

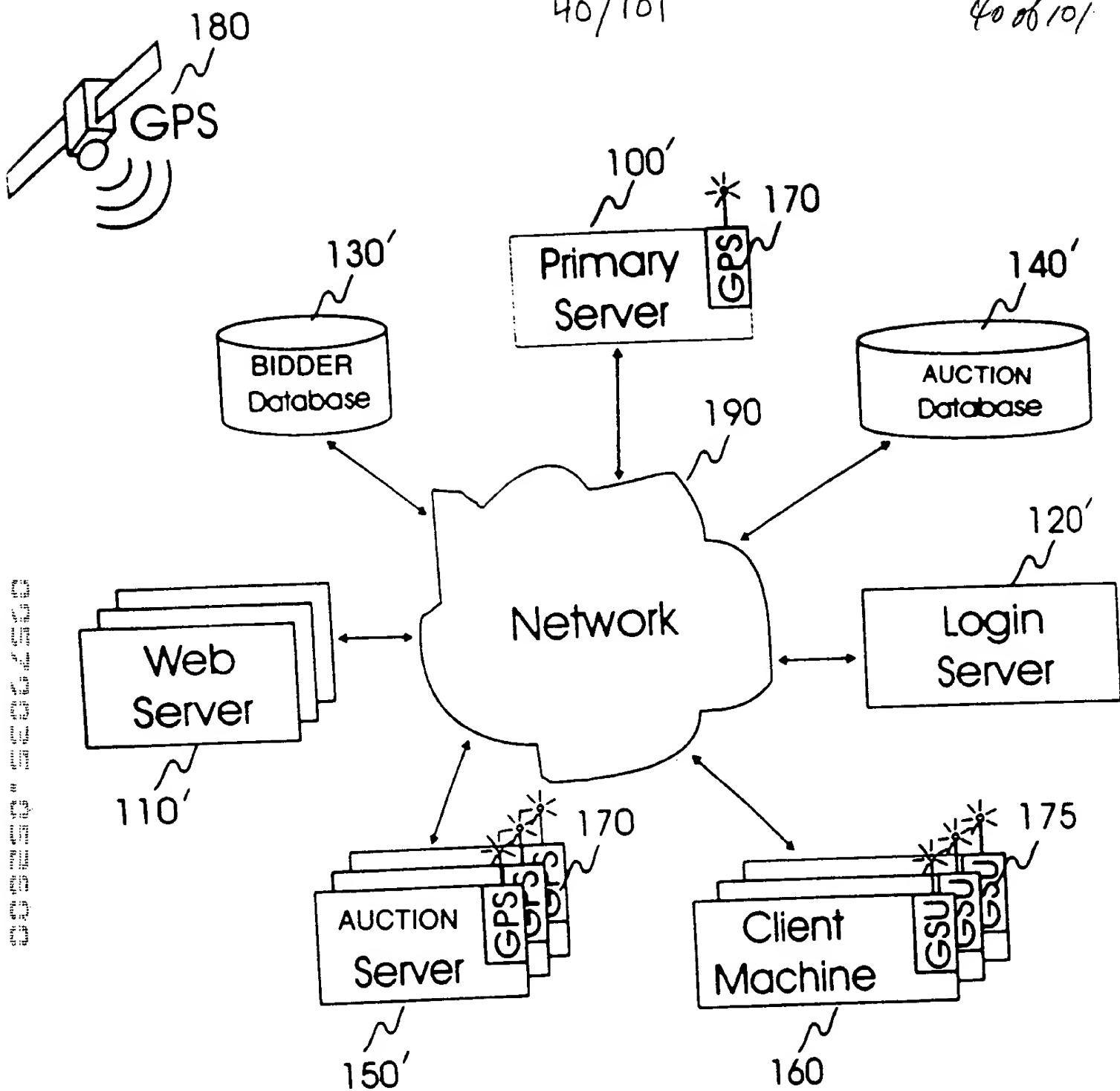
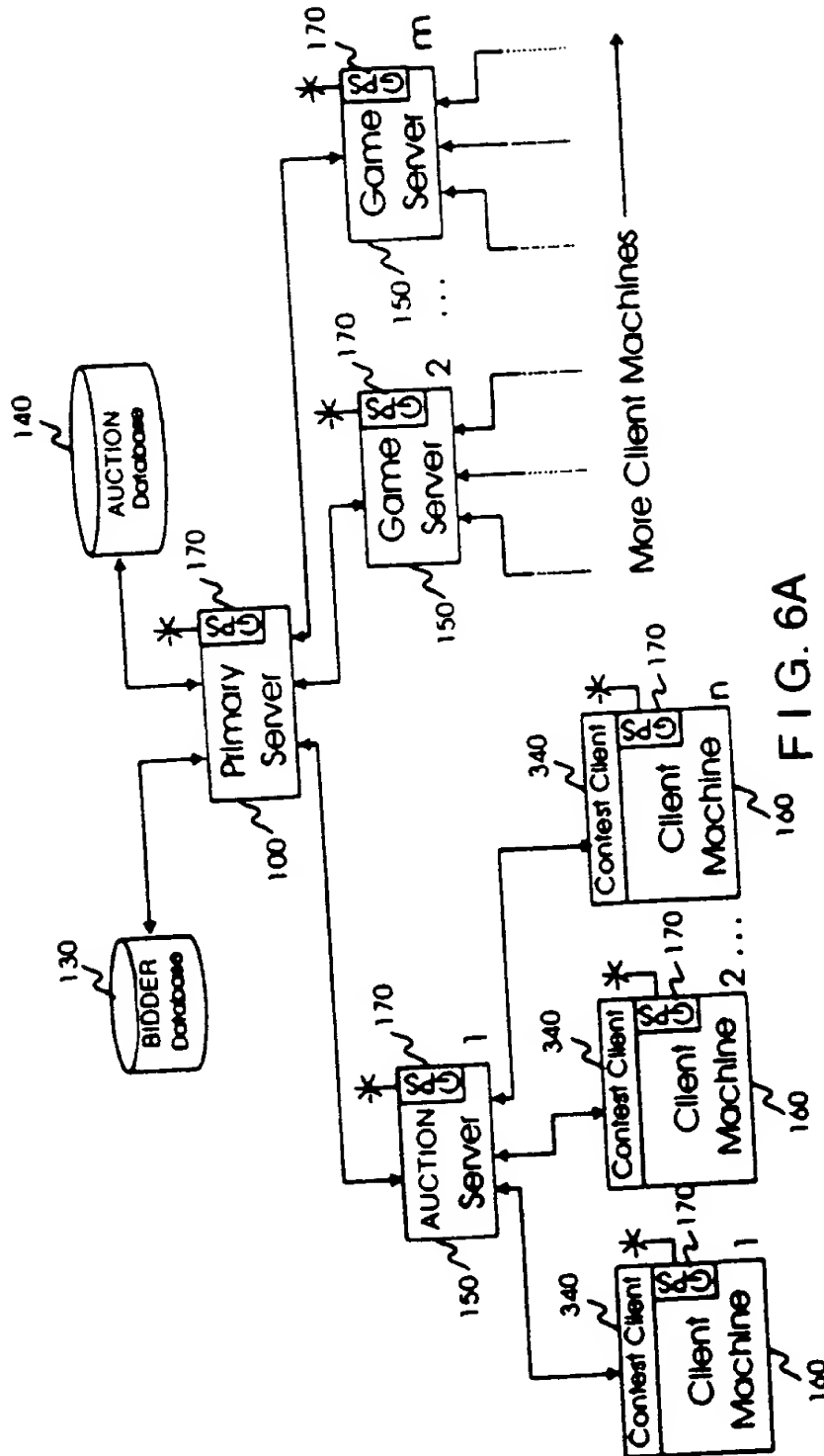


FIG. 6





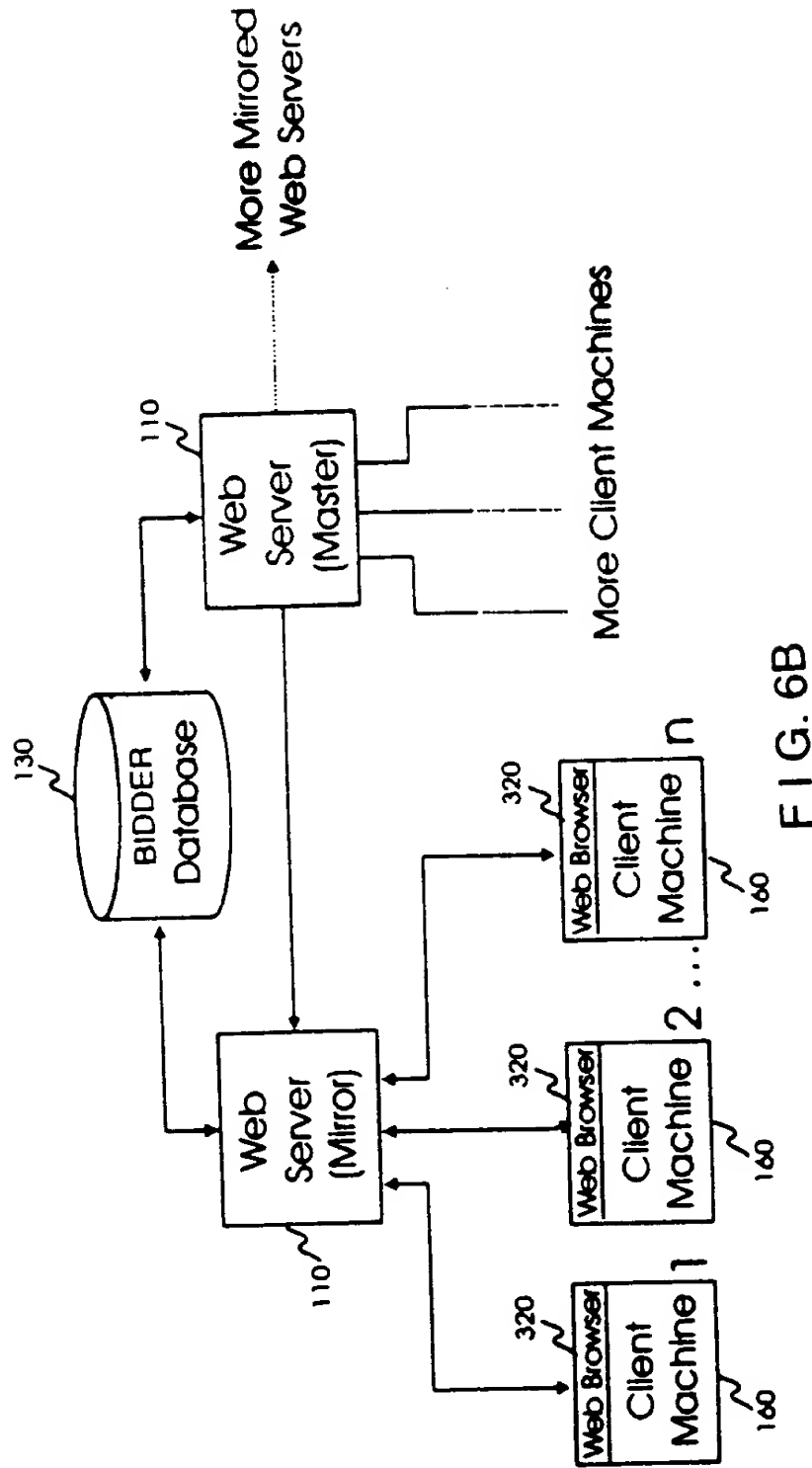


FIG. 6B

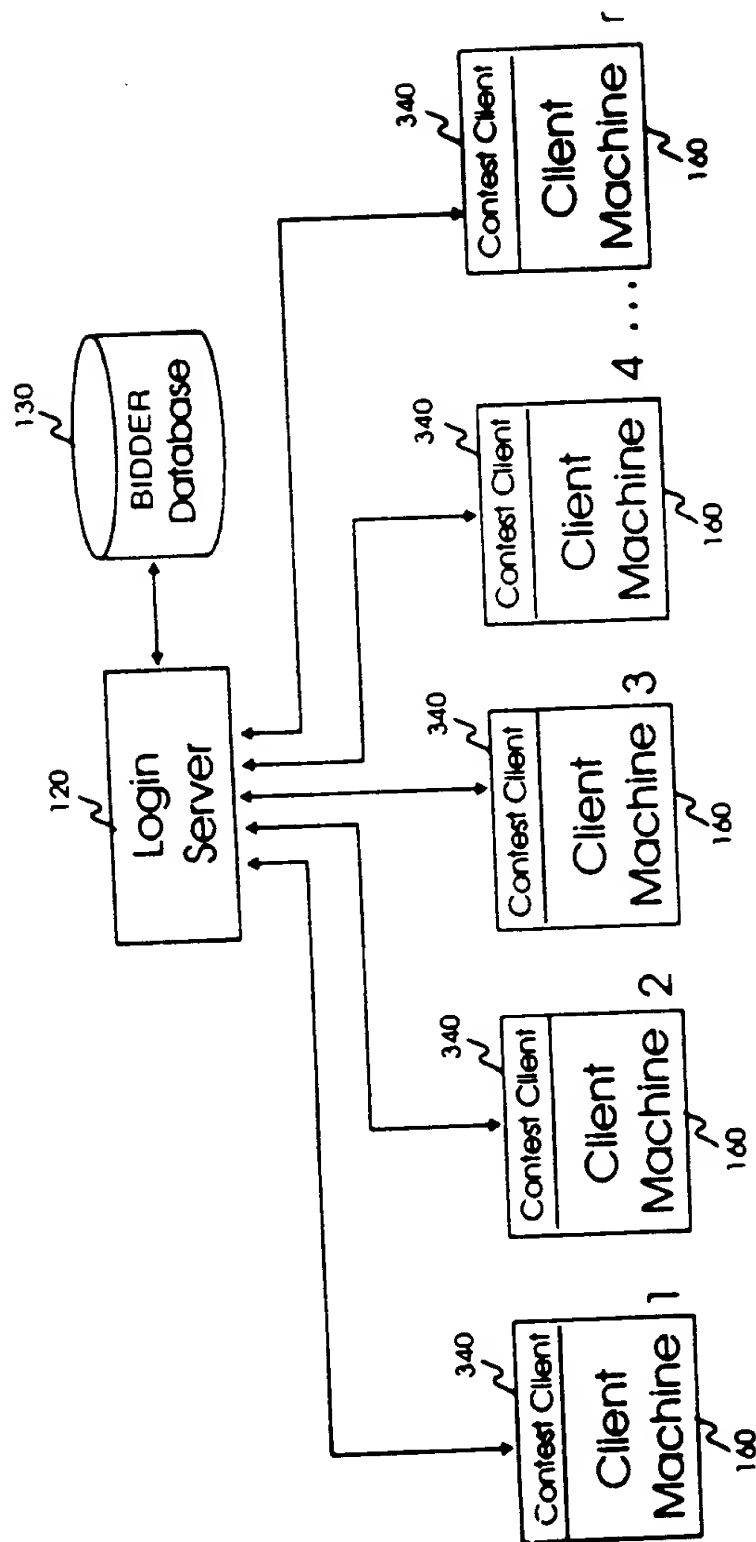


FIG. 6C

# Client Machine 160

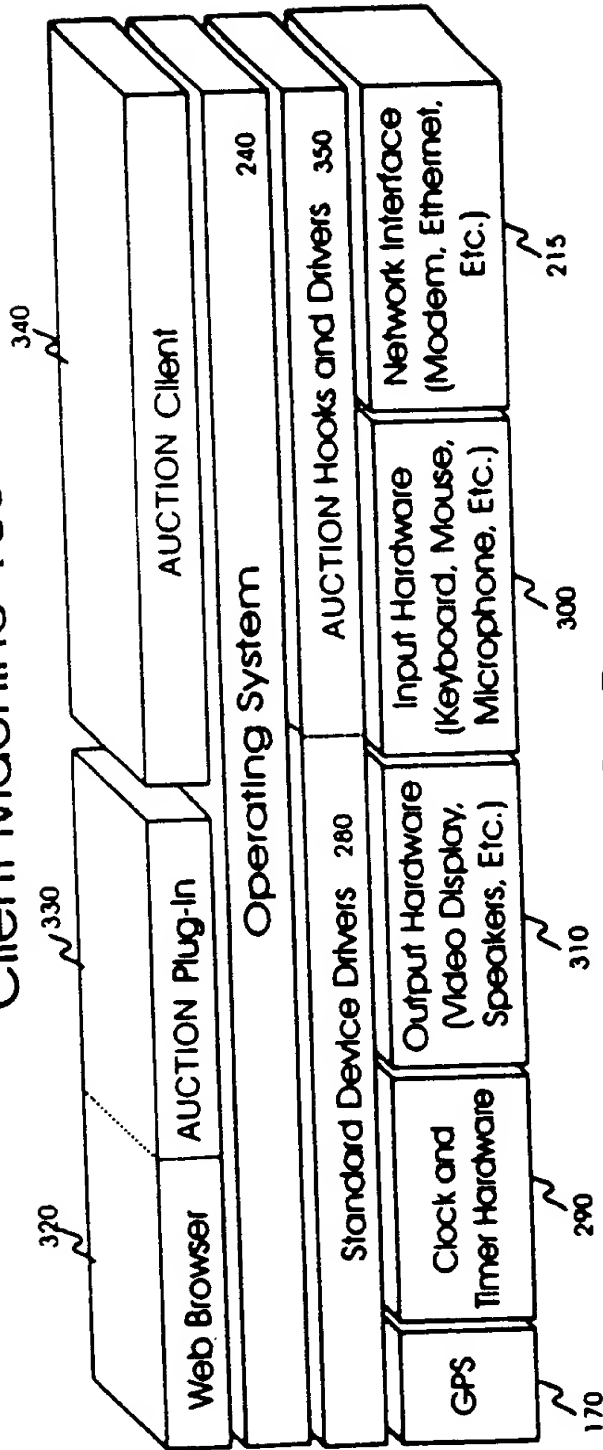


FIG. 6D

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# AUCTION SERVER 150'

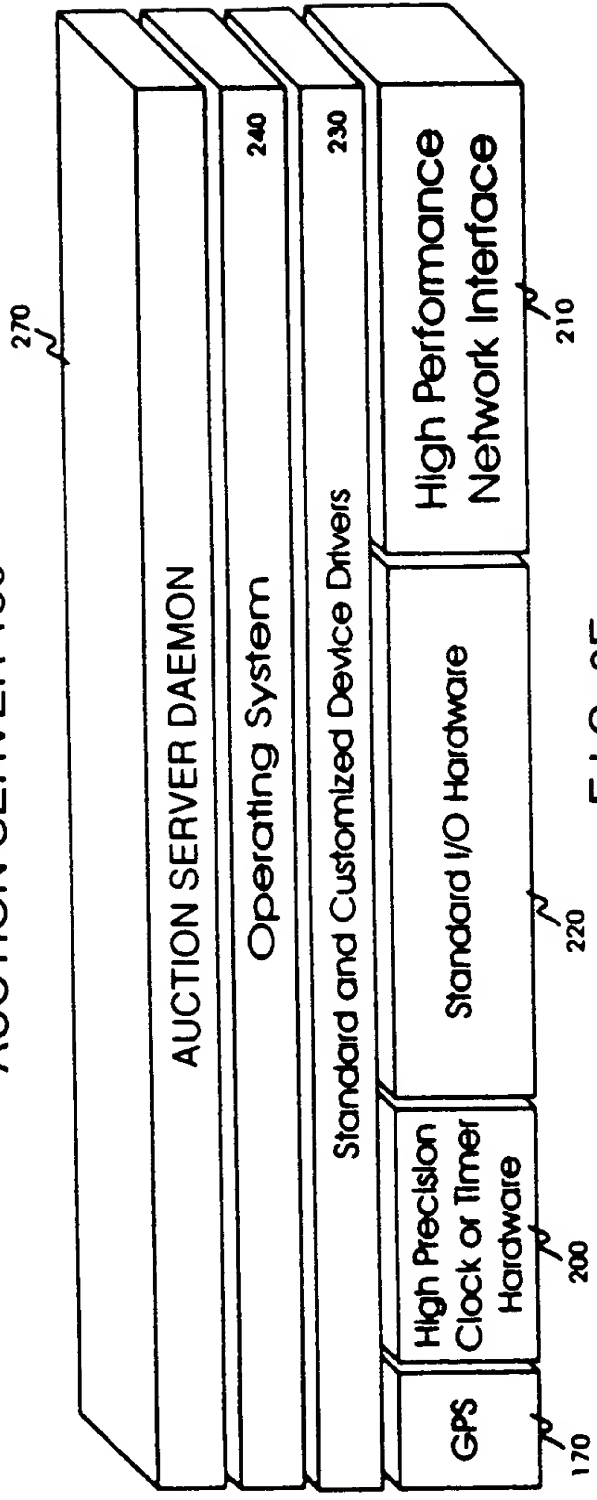


FIG. 6E

# Web Server 110

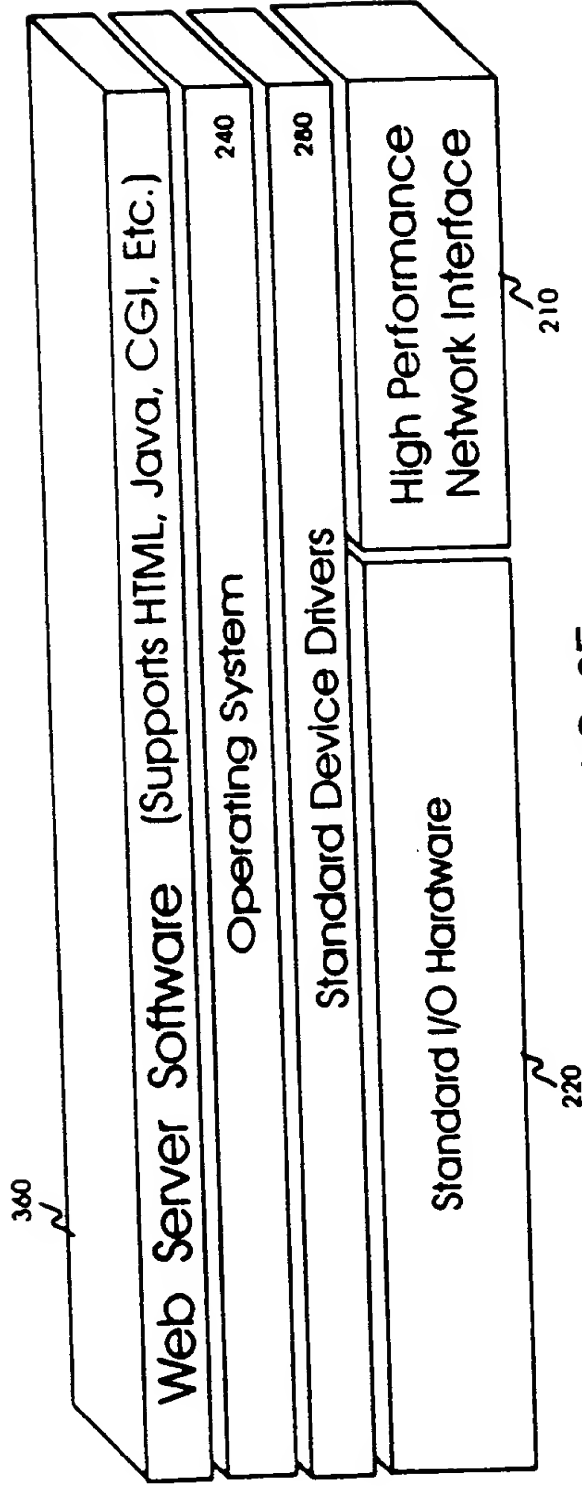
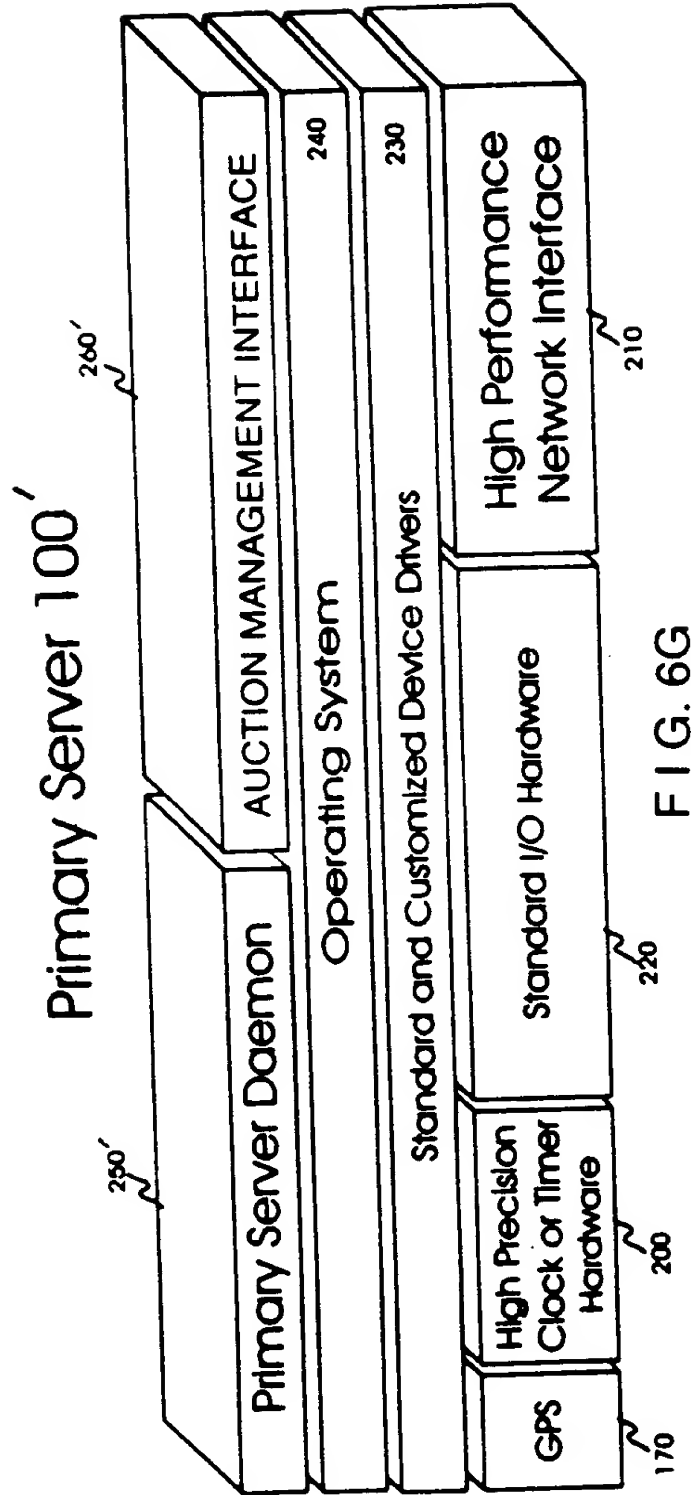


FIG. 6F



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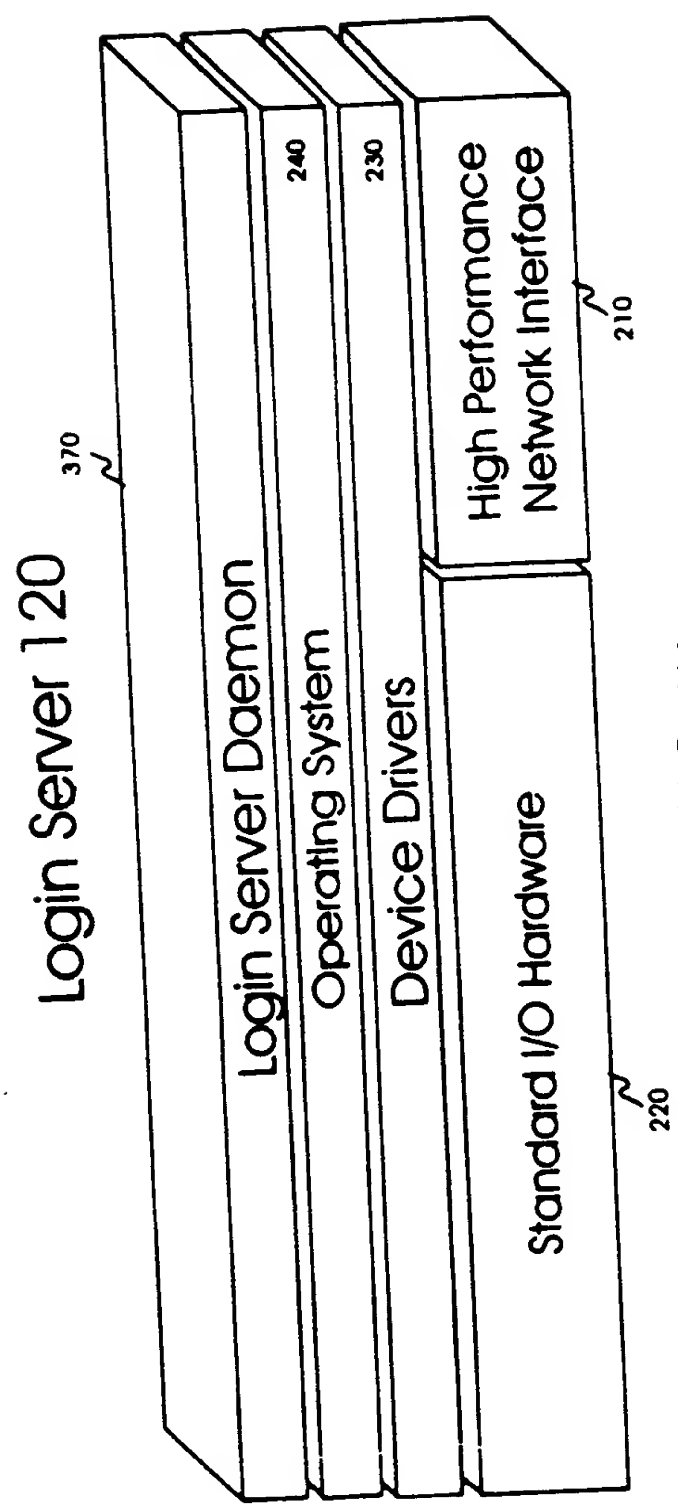


FIG. 6H



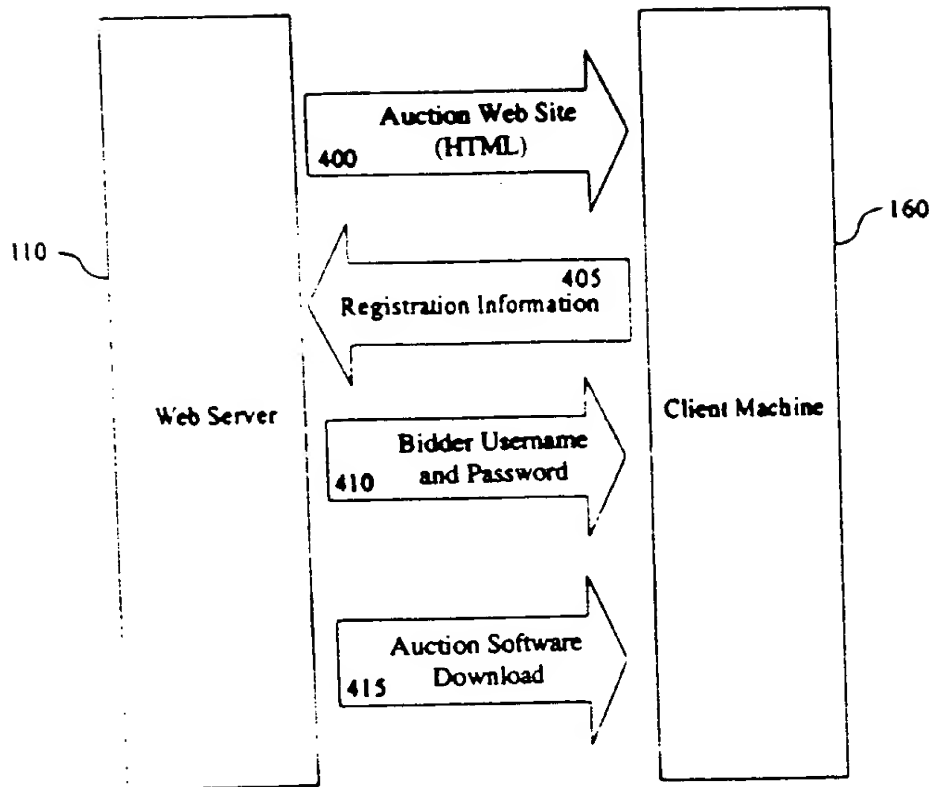


FIG. 7A

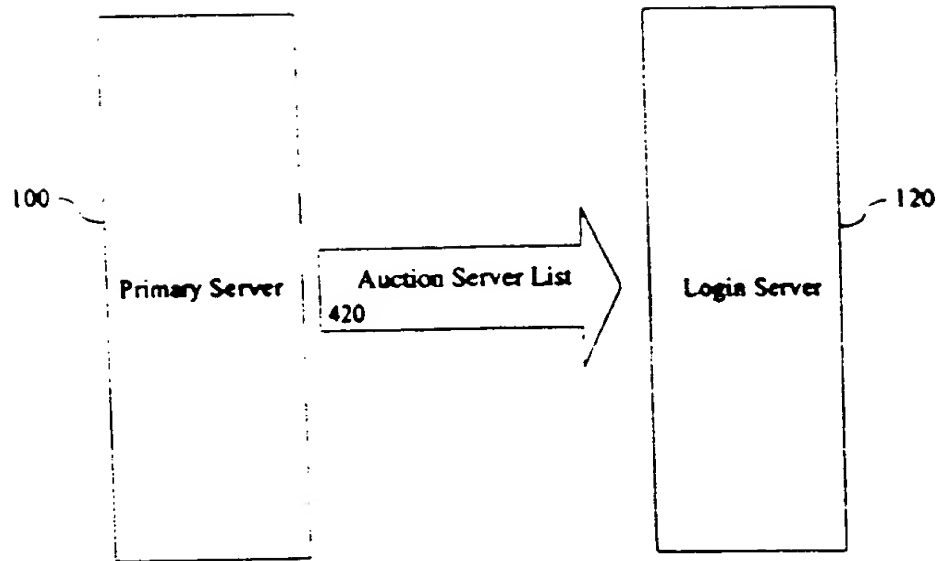


FIG. 7B

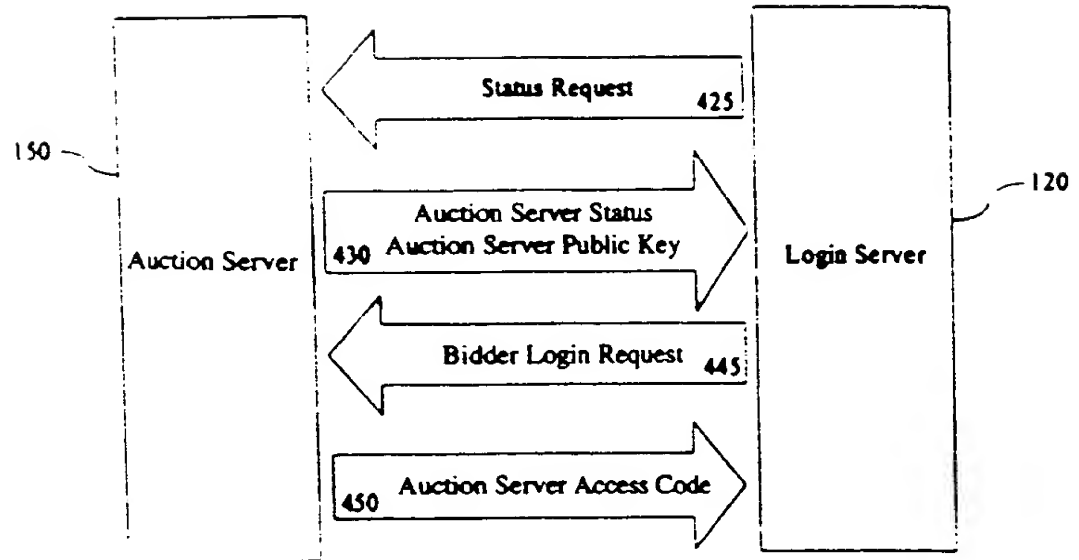


FIG. 7C

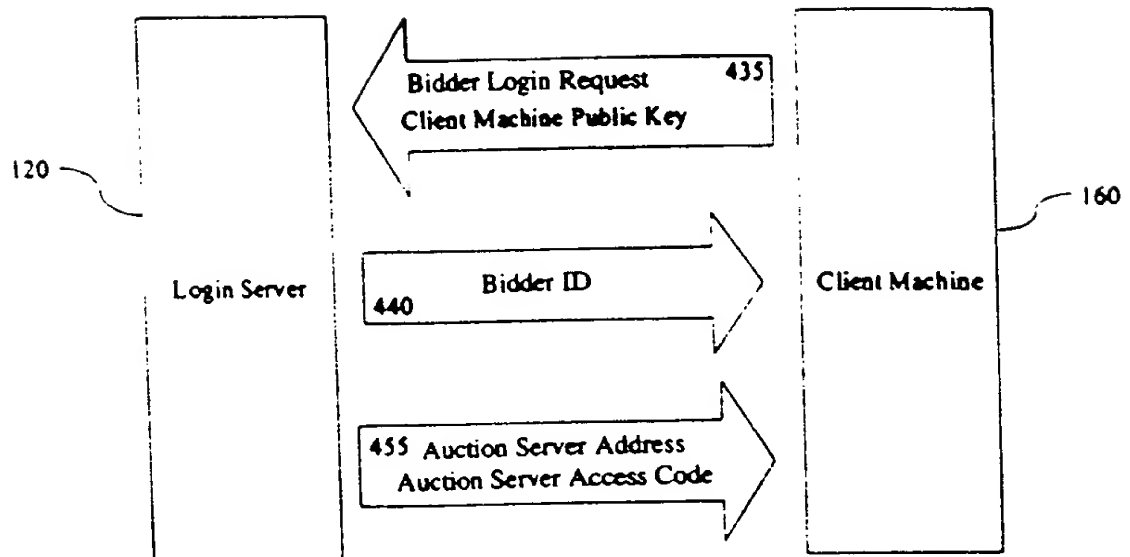


FIG. 7D

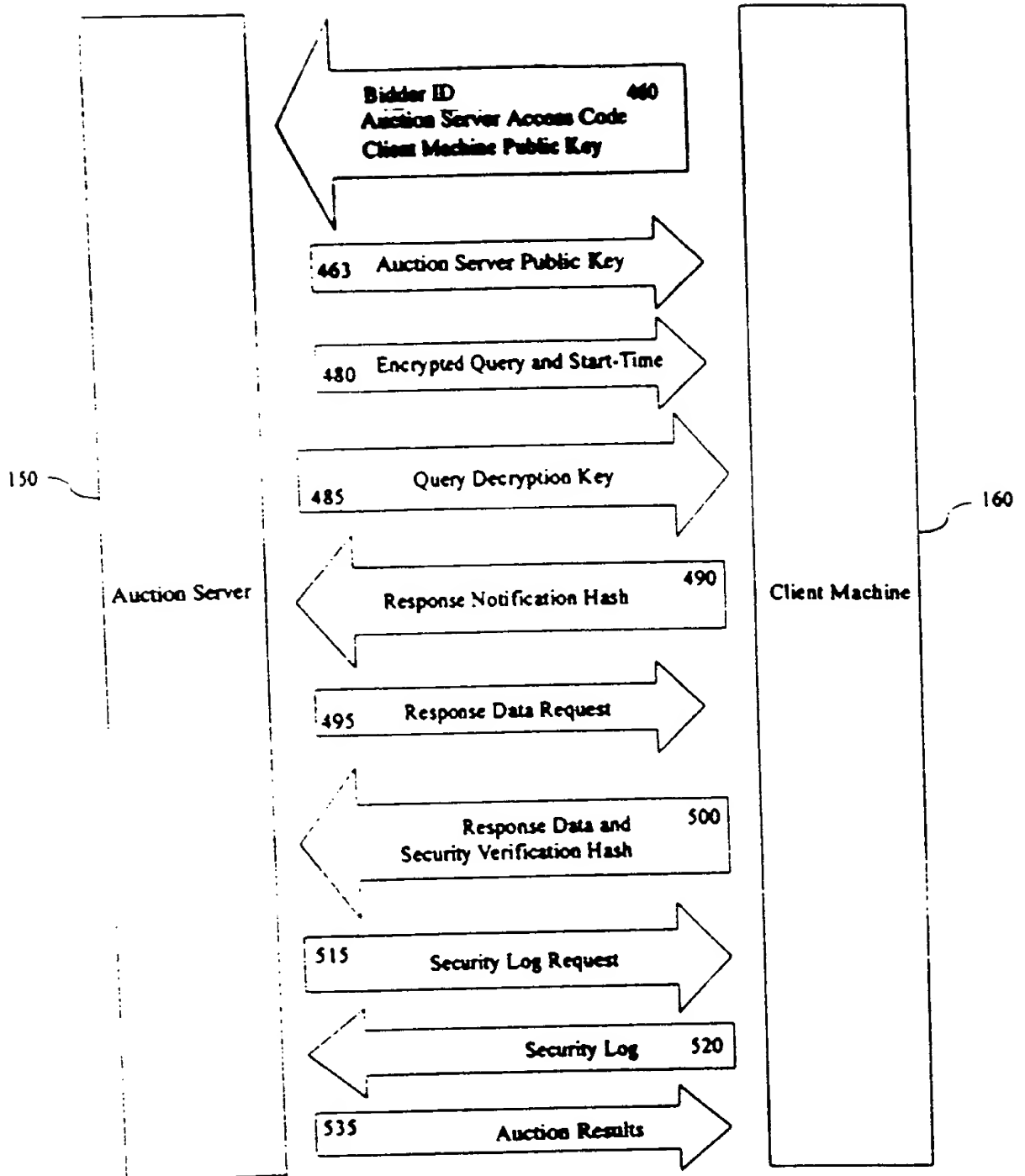


FIG. 7E

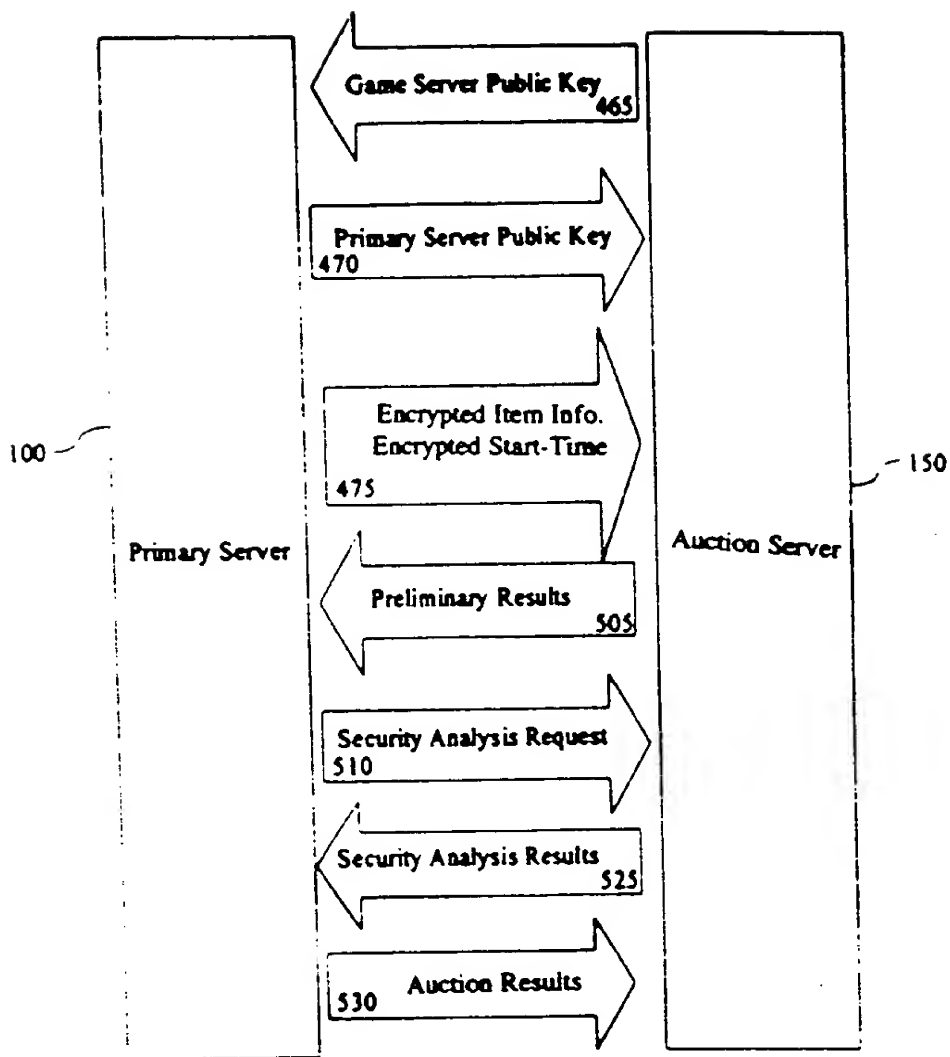


FIG. 7F

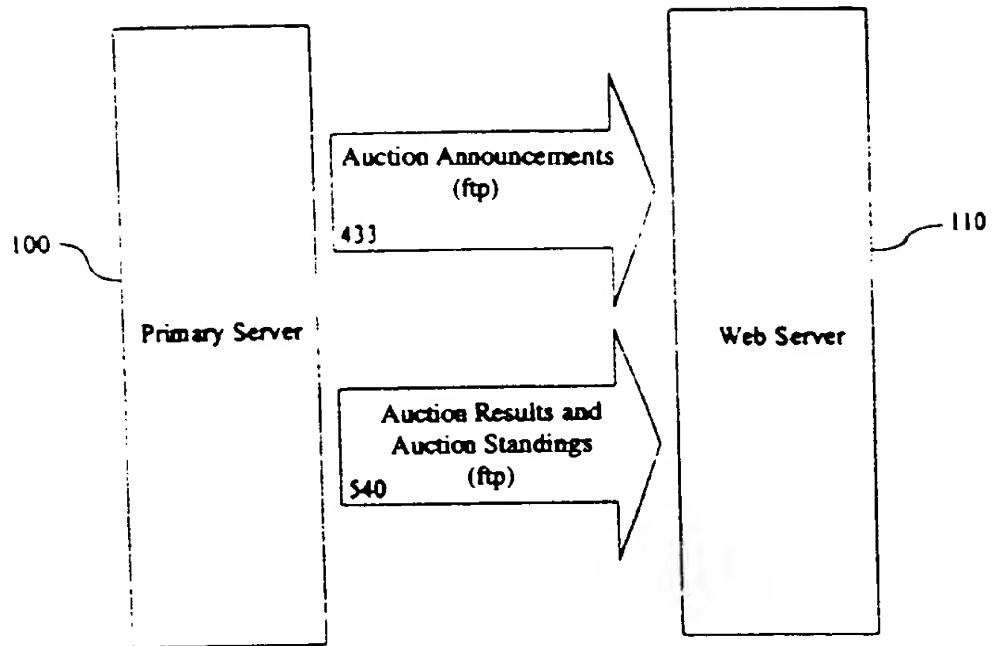


FIG. 7G

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**BID HISTORY  
AUCTION INFORMATION DATA FIELDS**

|                          |
|--------------------------|
| ITEM NUMBER              |
| DESCRIPTION              |
| CATEGORY                 |
| MINIMUM SALE AMOUNT      |
| BID INCREMENTS           |
| START TIME               |
| END TIME (IF APPLICABLE) |
| HIGHEST BID              |
| ALL BID INFORMATION      |
| OWNER                    |
| ADDRESS                  |
| EMAIL                    |
| PHONE                    |
| SALE HISTORY             |
| BUYER COMMENTS           |

**FIG. 8B**

**LOGIN INFORMATION DATA FIELDS**

|                           |
|---------------------------|
| USERNAME                  |
| PASSWORD                  |
| NAME                      |
| ADDRESS                   |
| EMAIL                     |
| CREDIT CARDS              |
| CREDIT INFORMATION/RATING |
| UNIQUE IDENTIFICATION     |
| NETWORK LATENCY HISTORY   |

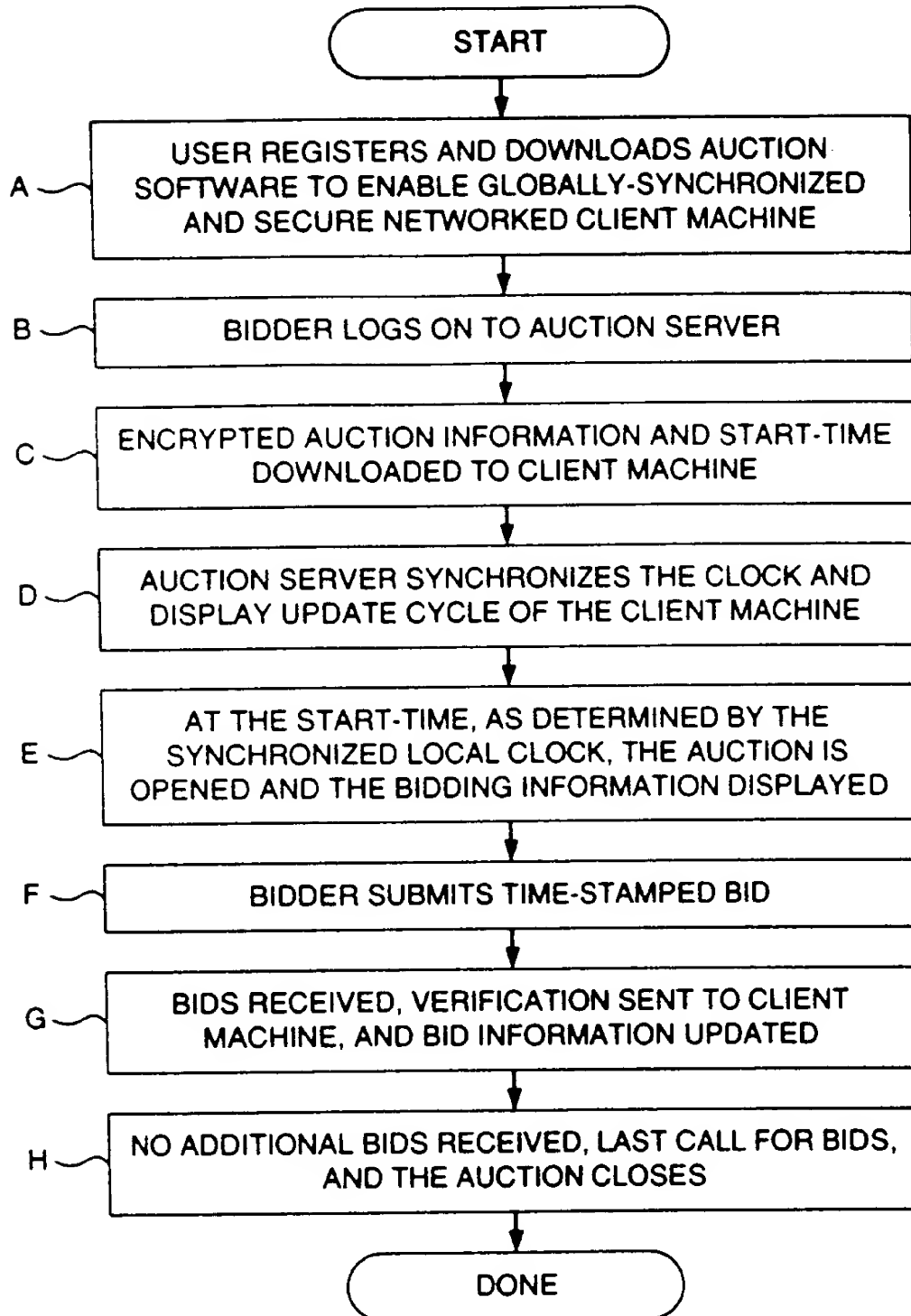
**FIG. 8A**

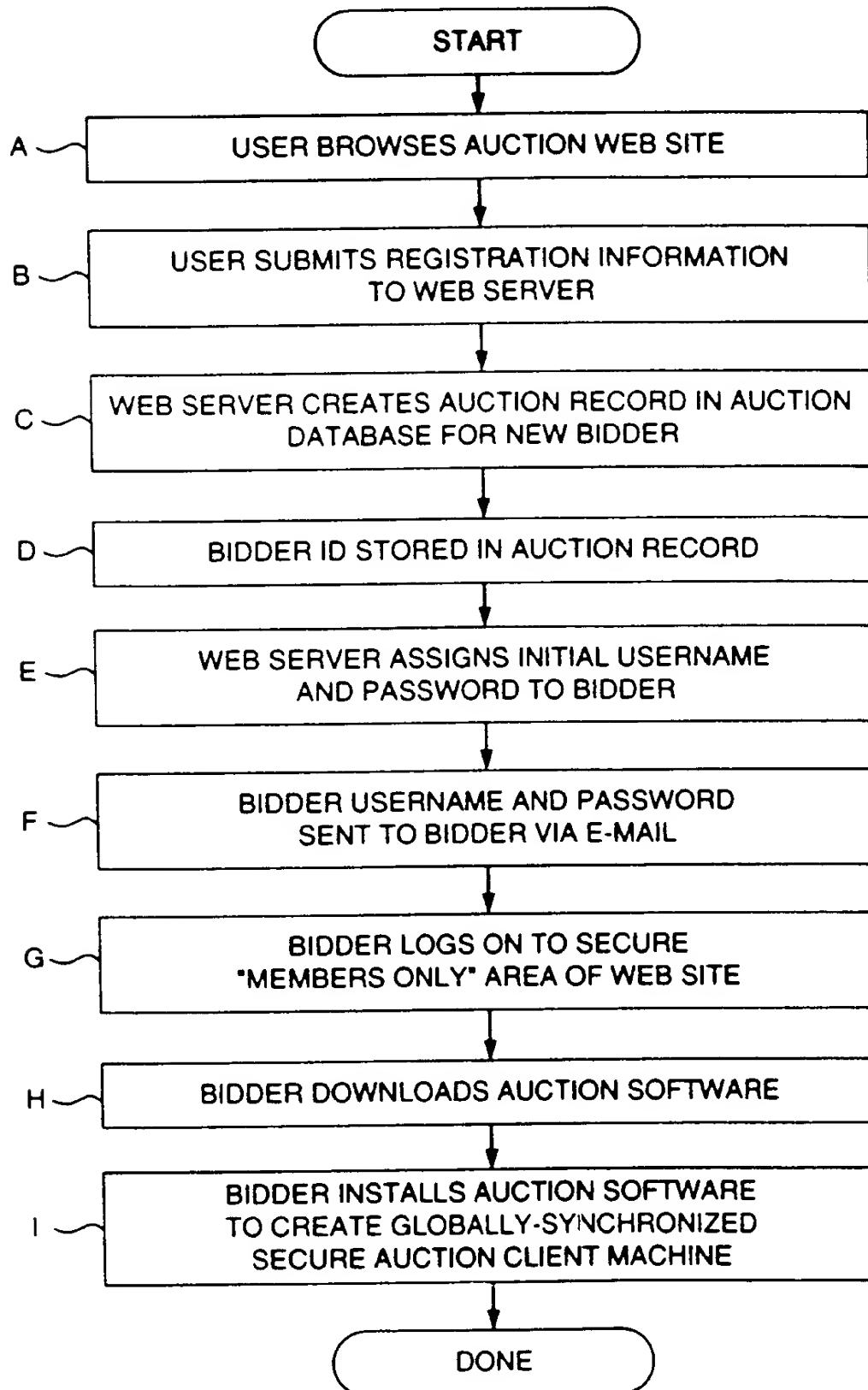
**BID INFORMATION DATA FIELDS**

|                            |
|----------------------------|
| USERNAME                   |
| UNIQUE IDENTIFICATION      |
| SUBMISSION-TIME TIME STAMP |
| RECEIPT-TIME TIME STAMP    |
| BID AMOUNT                 |
| VERIFICATION KEY           |

**FIG. 8C**



**THE AUCTION PROCESS****FIG. 9**

**USER REGISTERS AND DOWNLOADS AUCTION SOFTWARE****FIG. 9A**

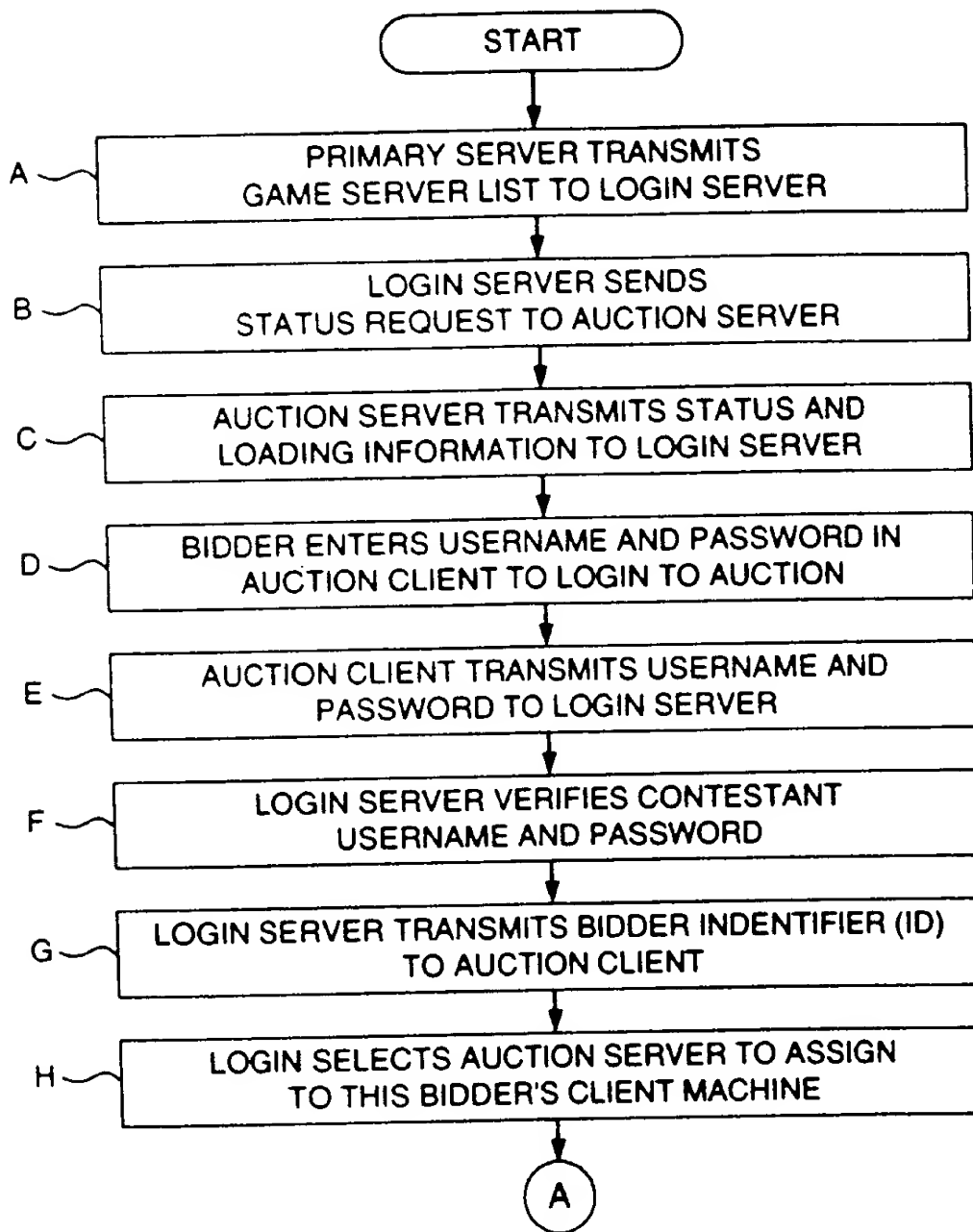
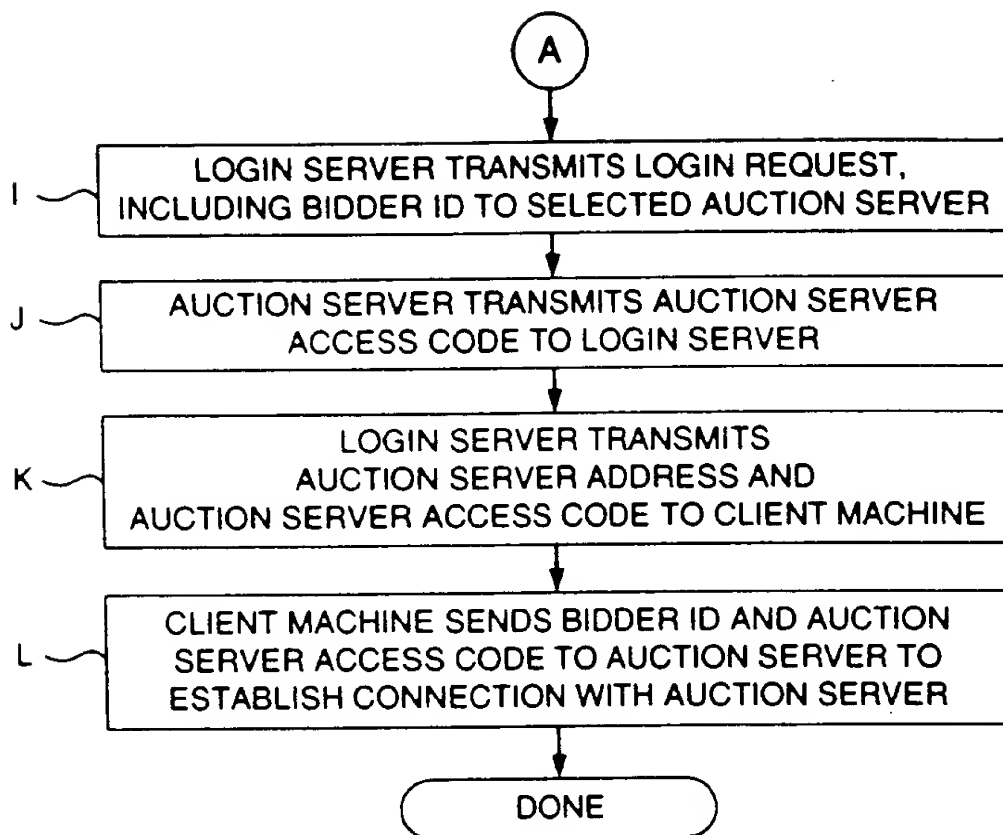
**BIDDER LOGS ON TO AUCTION SERVER**

FIG. 9B1

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F I G. 9B2

**ENCRYPTED AUCTION INFORMATION AND START-TIME  
DOWNLOADED TO CLIENT MACHINE**

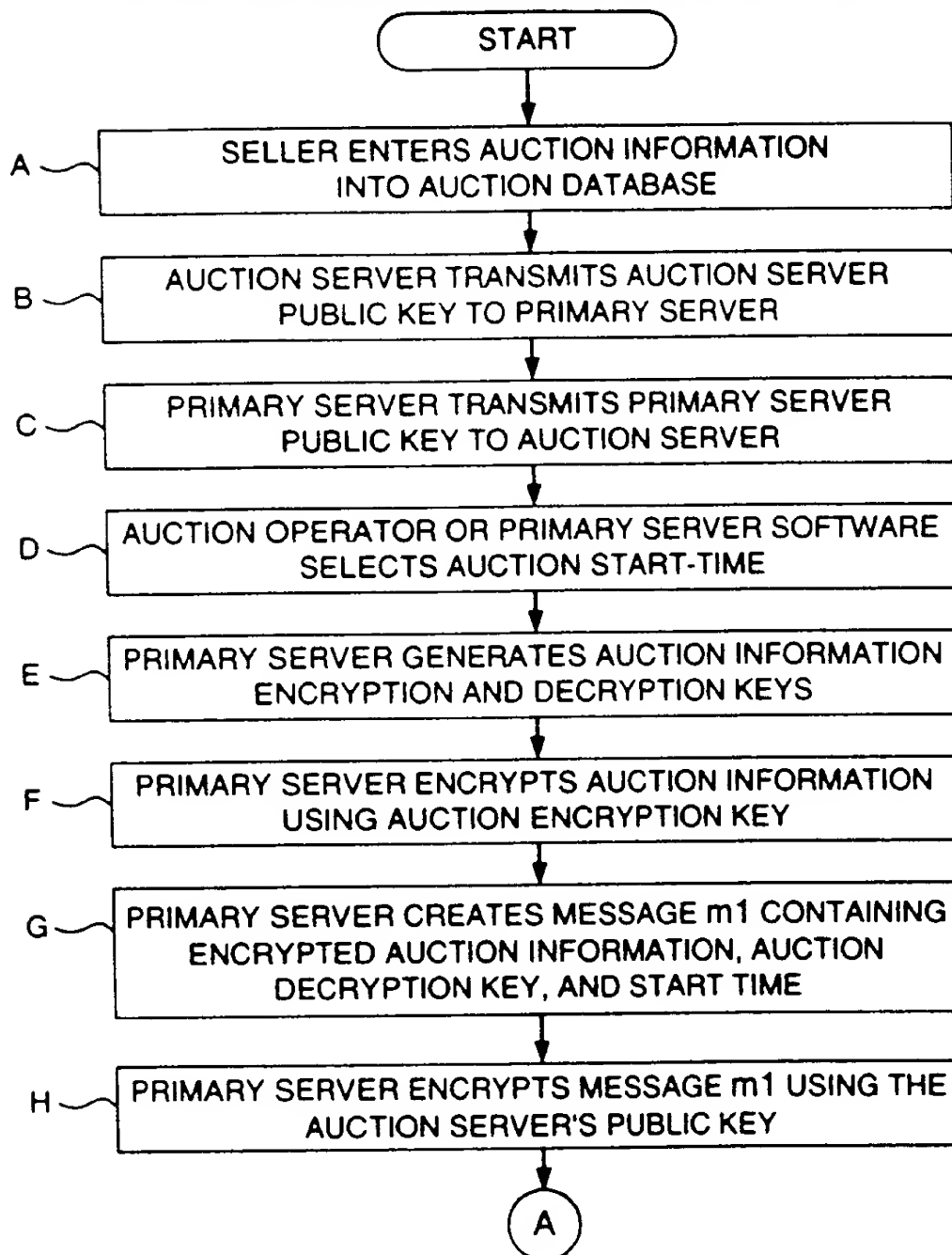


FIG. 9C1

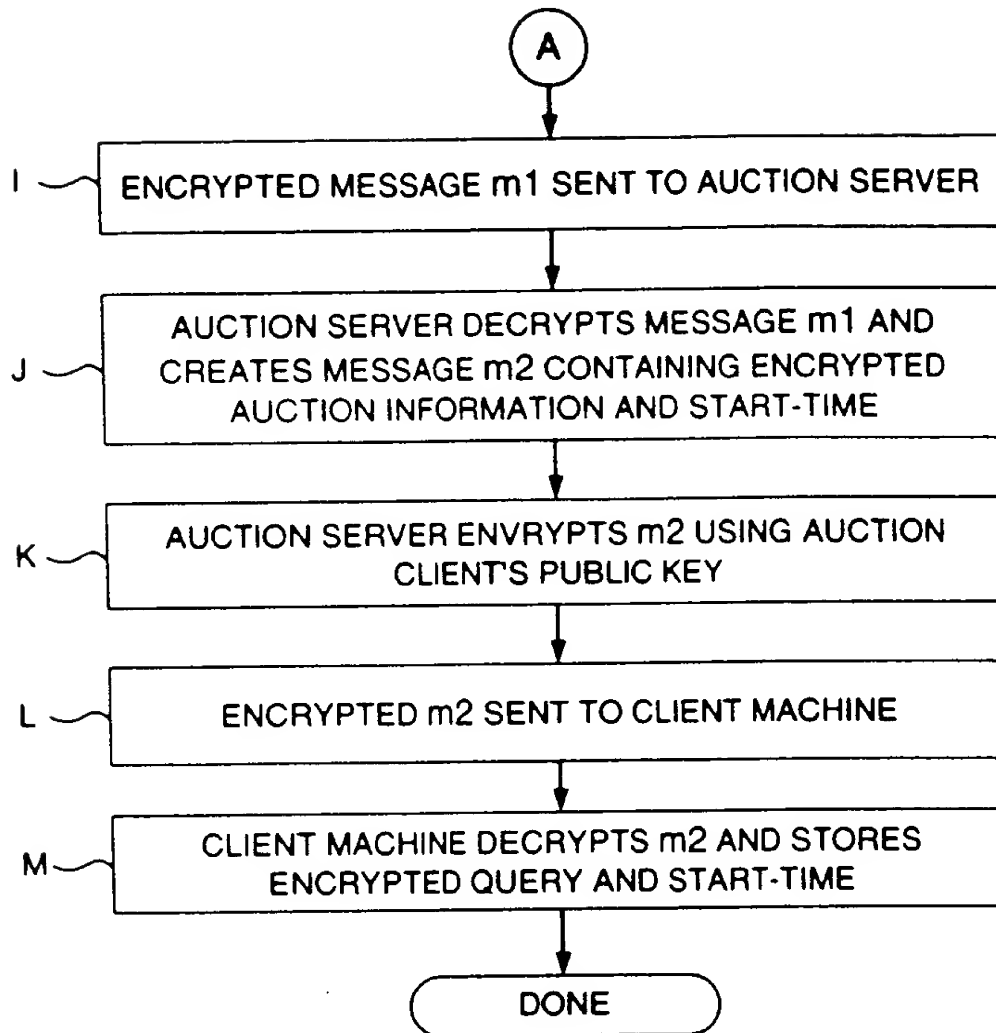


FIG. 9C2

**AUCTION SERVER SYNCHRONIZES THE CLOCK AND  
DISPLAY UPDATE CYCLE OF THE CLIENT MACHINE**

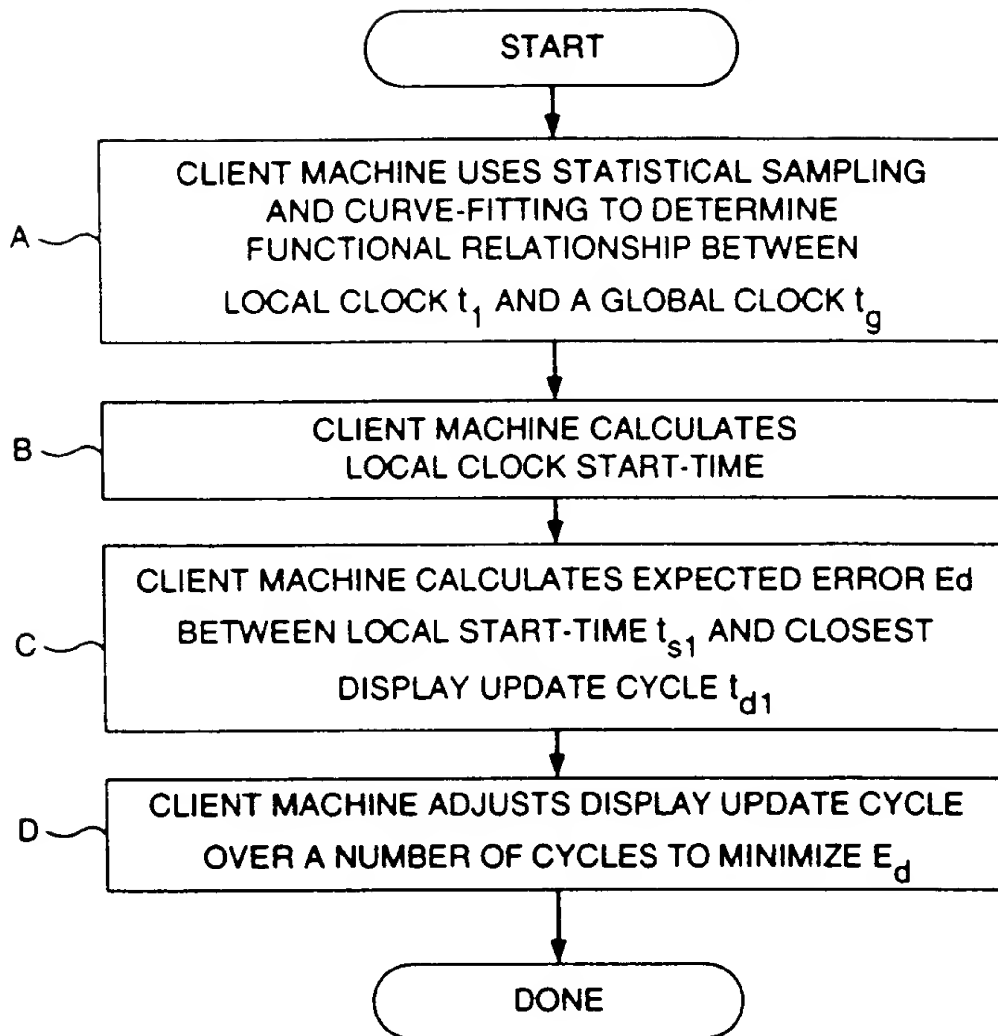


FIG. 9D

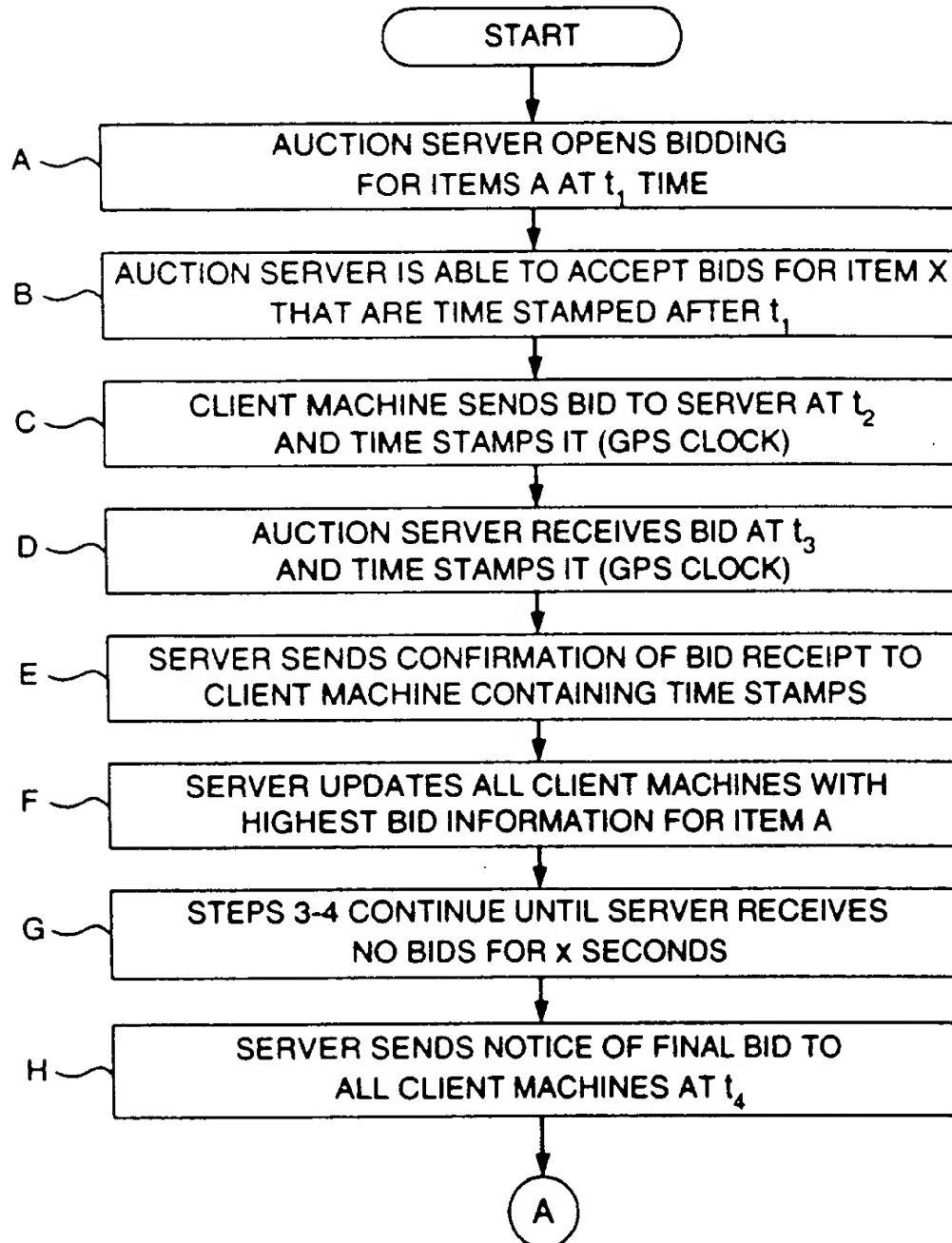
**HIGH LEVEL BIDDING PROCESS**

FIG. 9E1



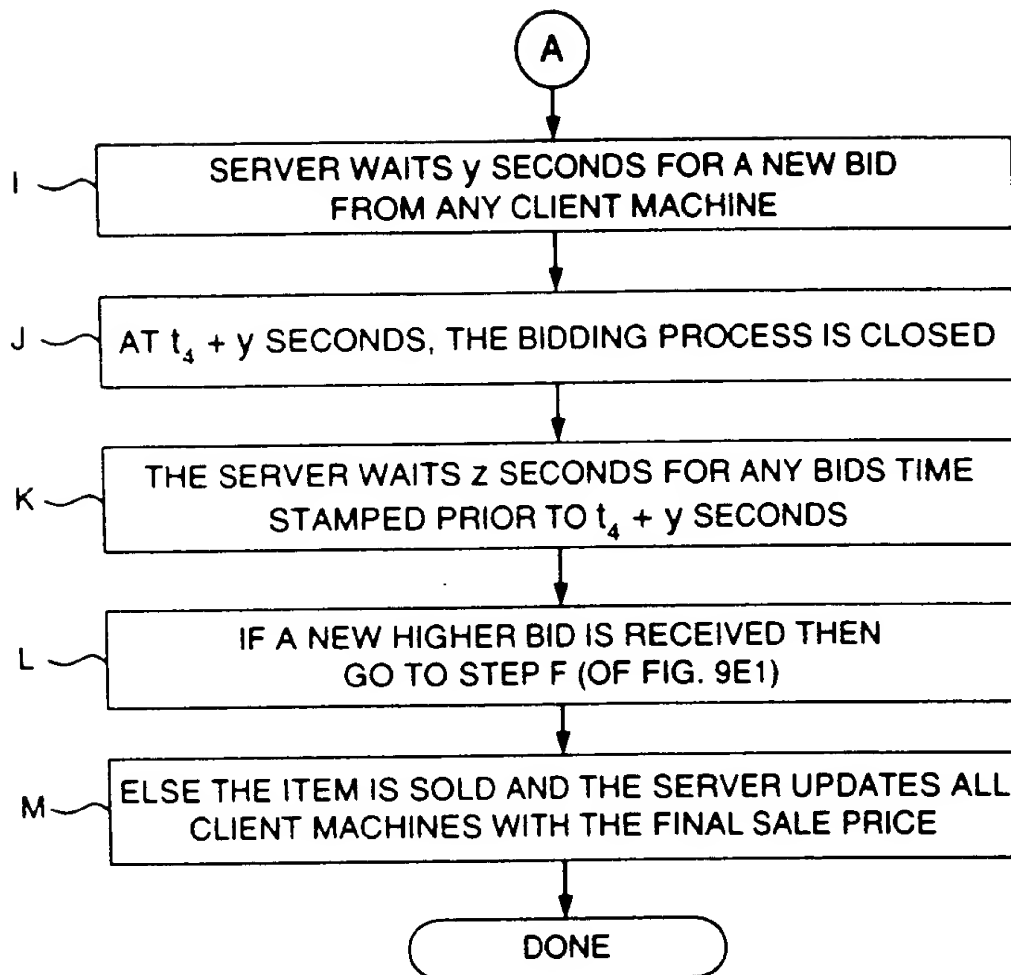


FIG. 9E2

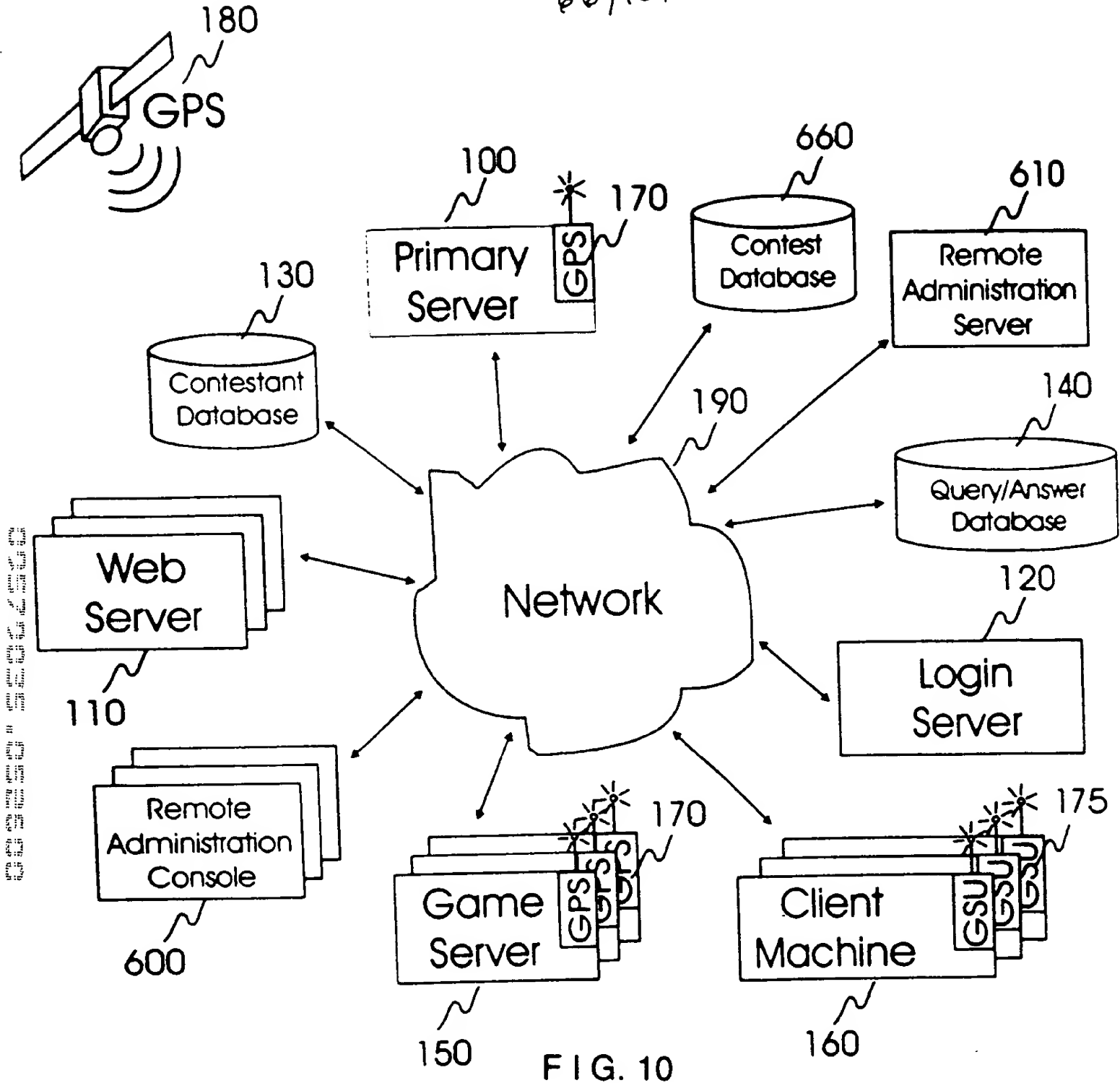


FIG. 10

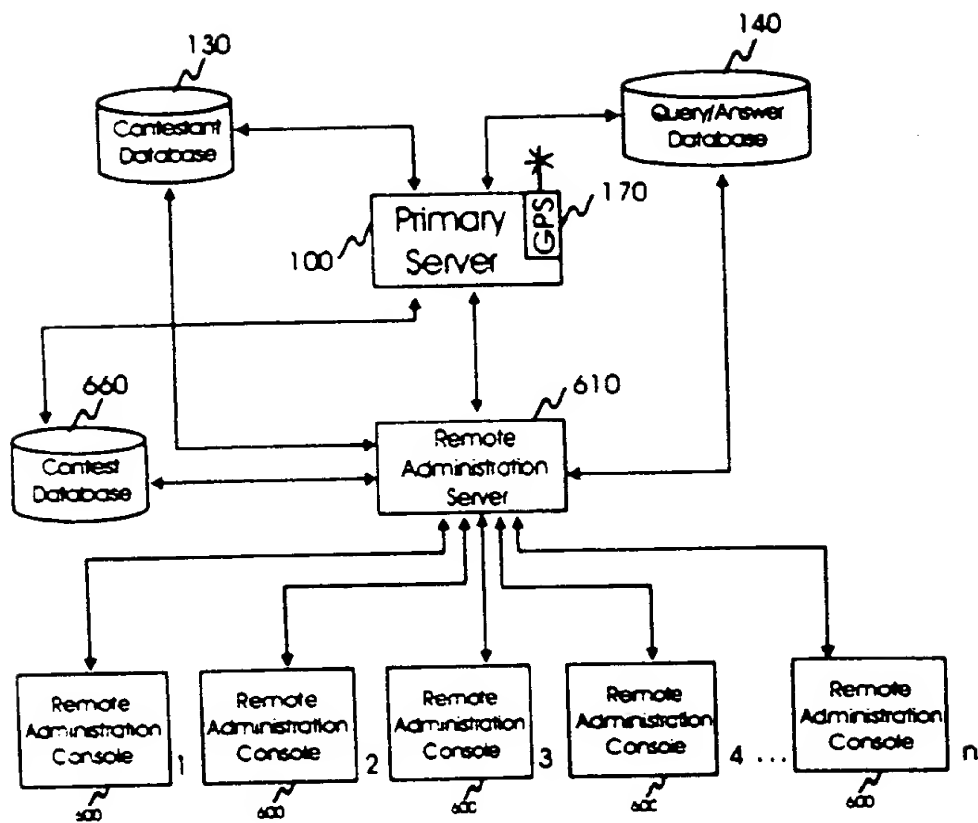


FIG. 10A

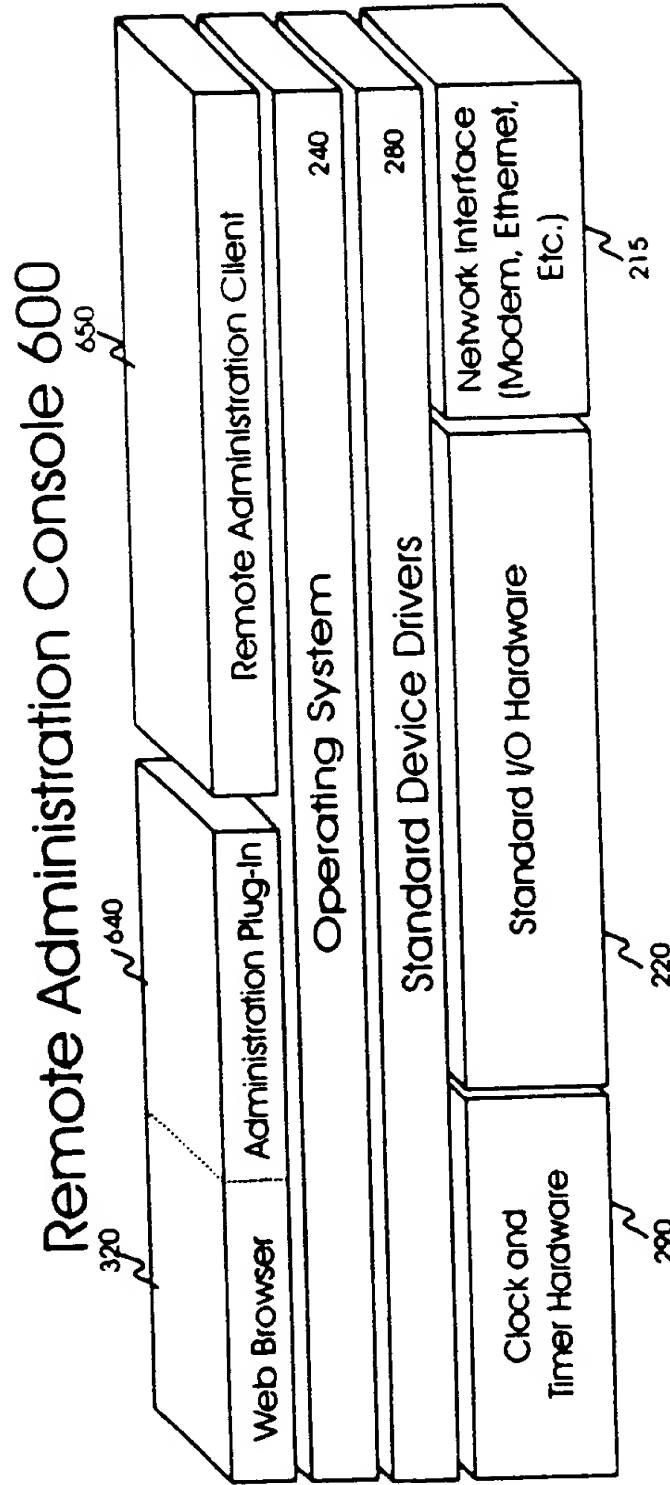


FIG. 10B

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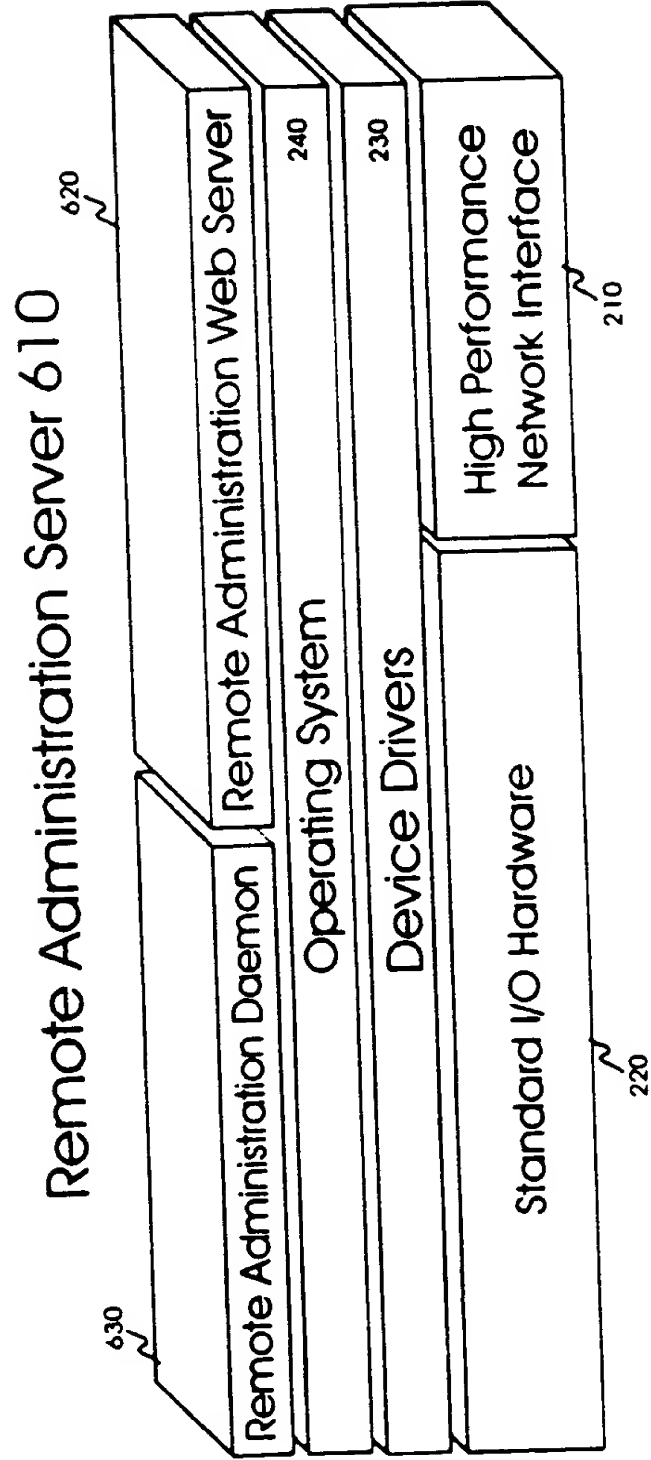


FIG. 10C

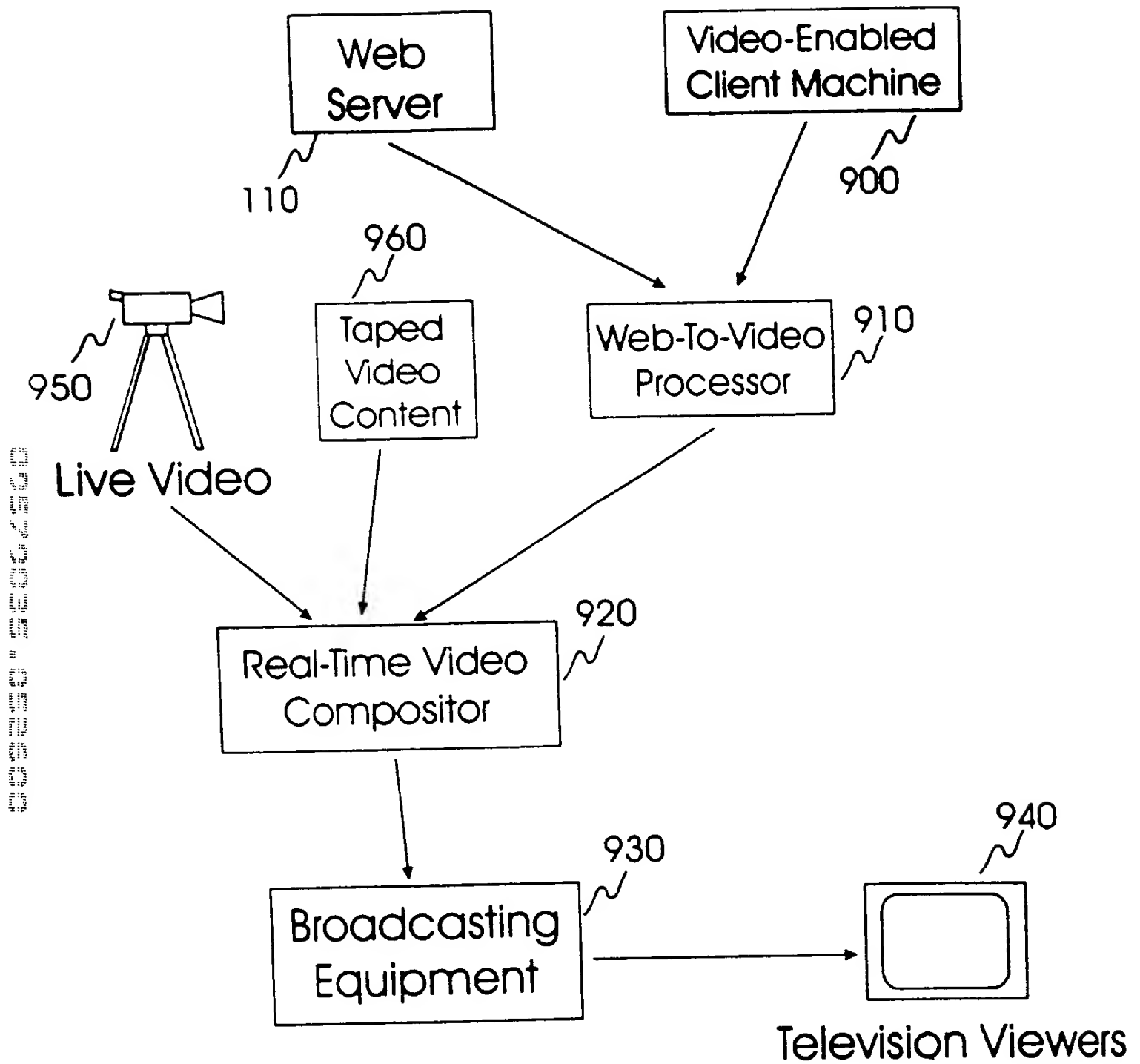


FIG. 11

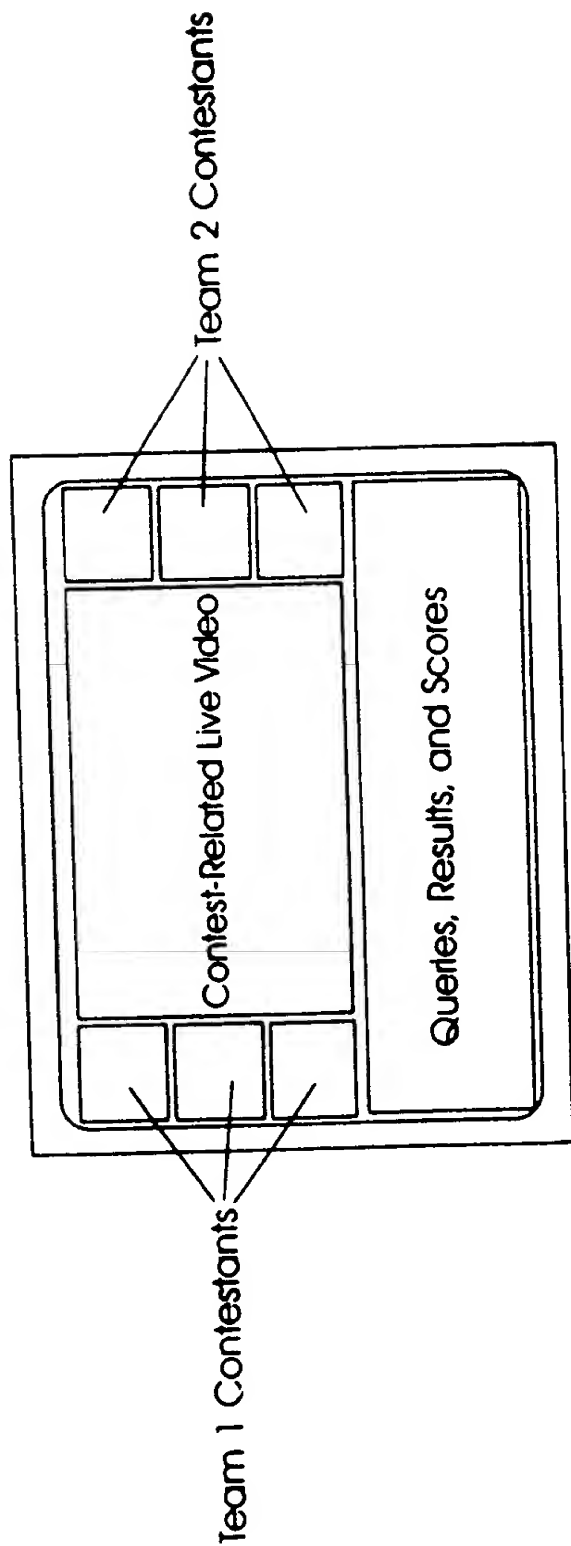


FIG. 11A

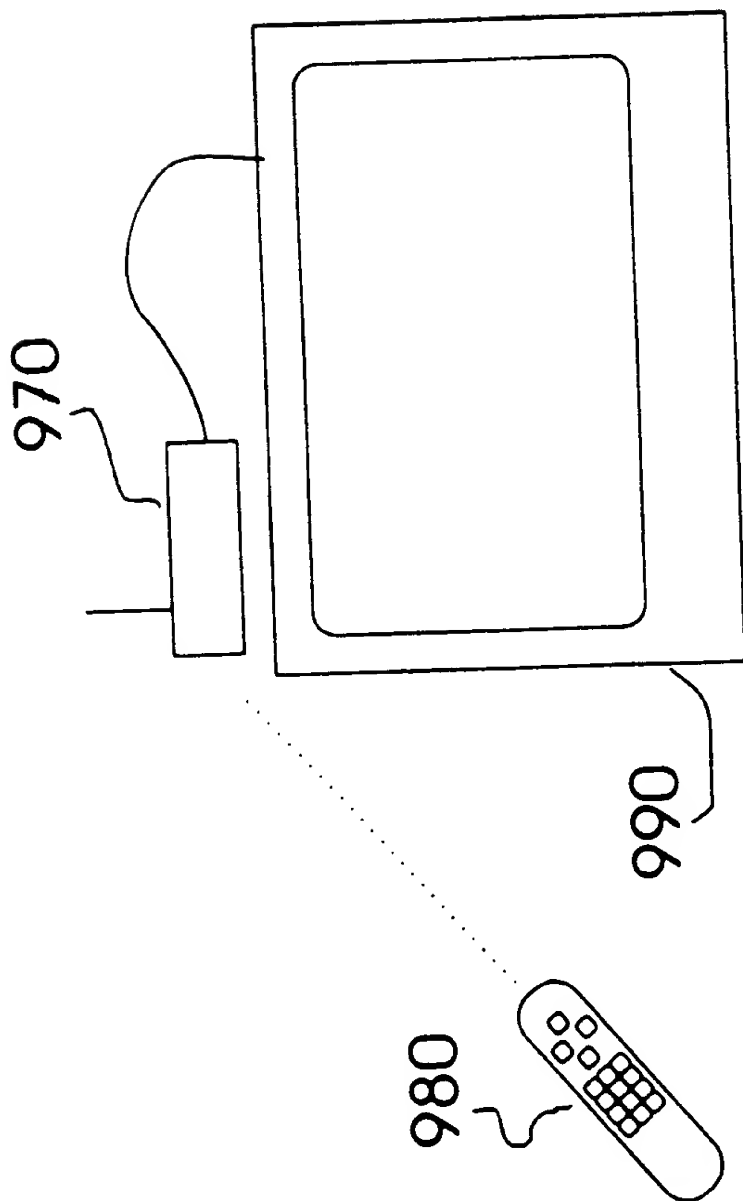


FIG. 12



# Set-Top Client Machine 970

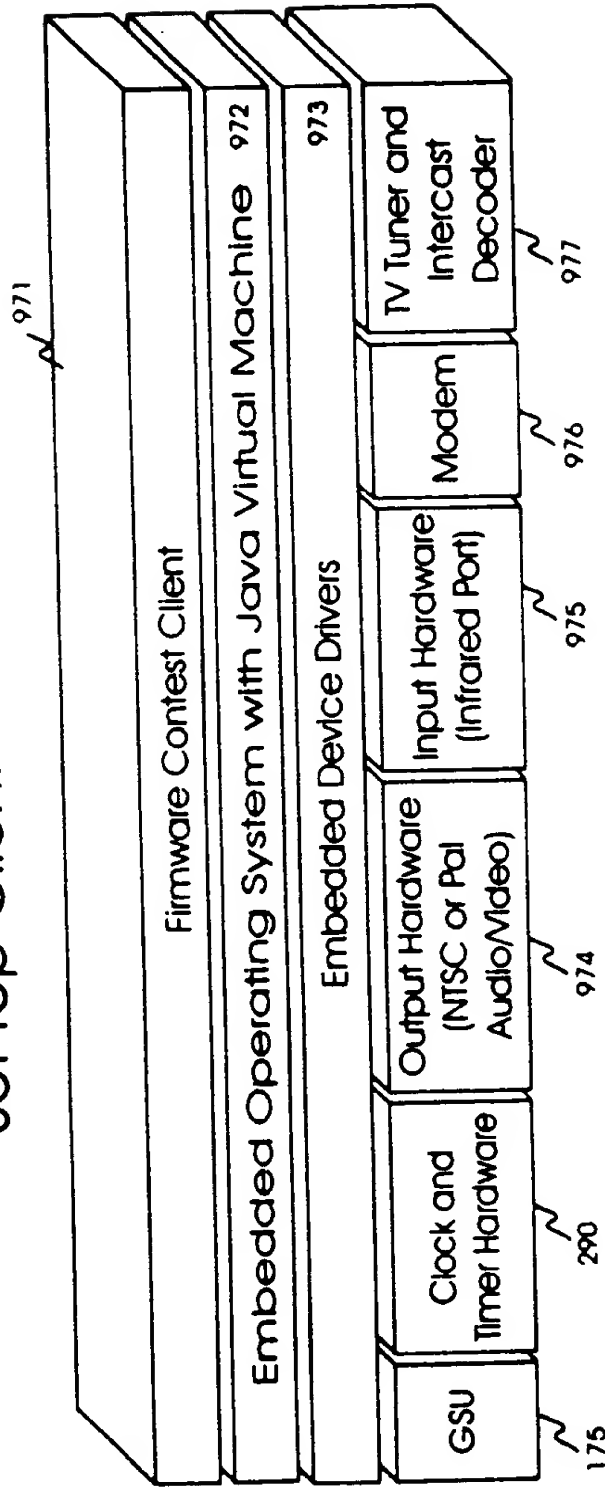


FIG. 12A

## Examples of GSU Inputs for Time and Space Stamping

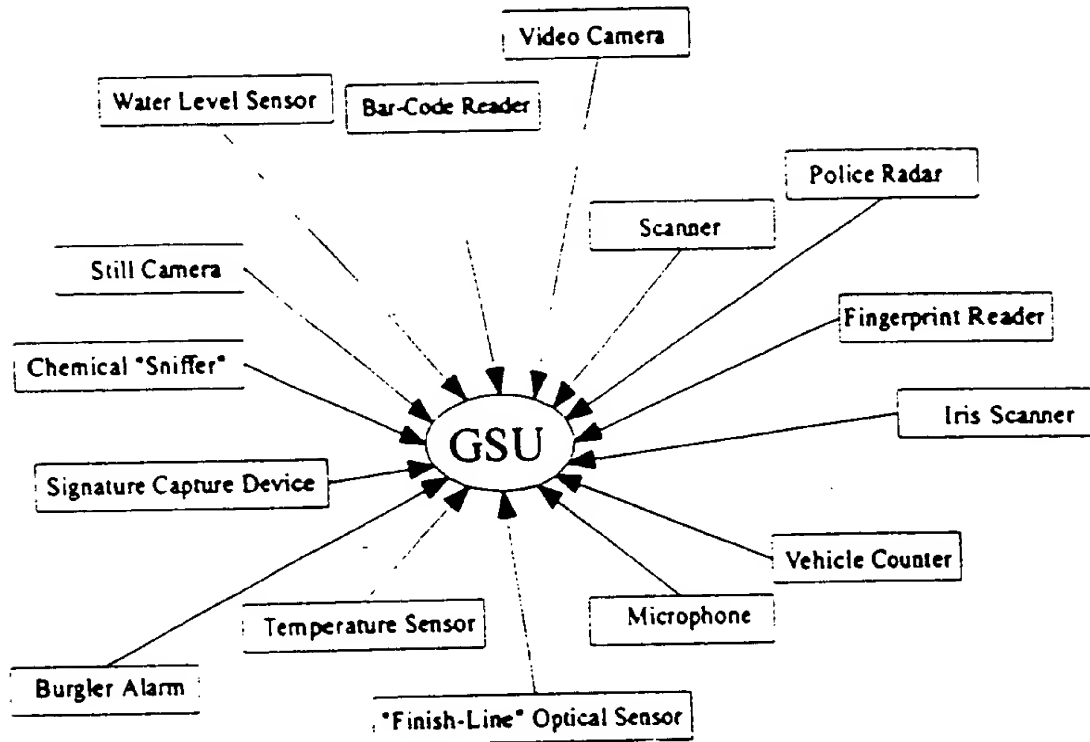
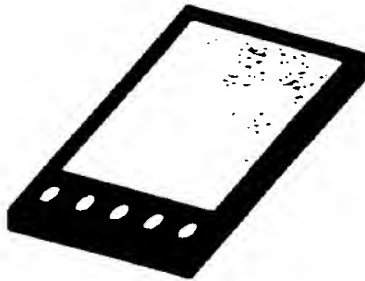
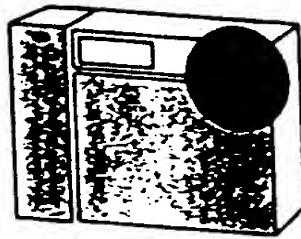


FIG. 13

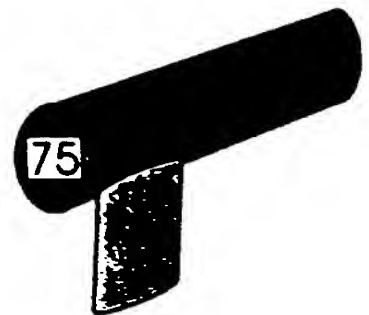
# Embedded GSU Applications



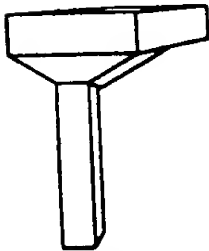
Handheld  
Computer



Digital  
Camera



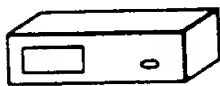
Police  
Radar



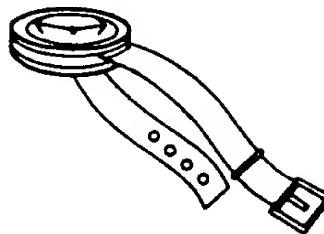
Bar Code  
Scanner



Scanner



CABLE TV SET-TOP  
BOXES



WRIST WATCH

FIG. 14

## Peripheral GSU Configurations

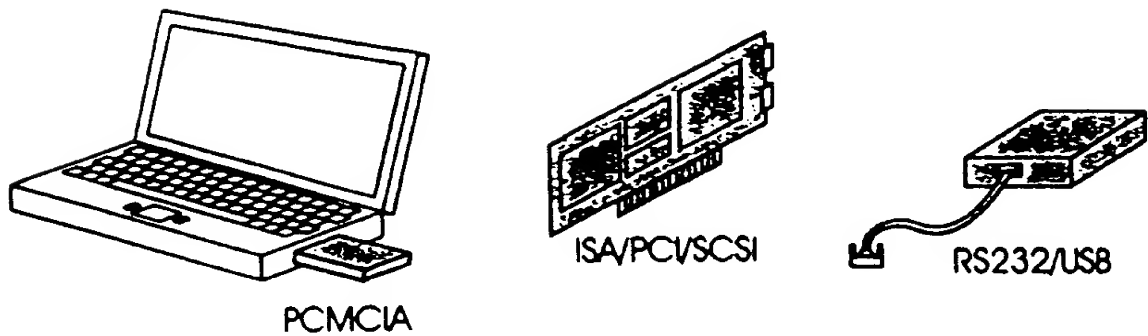


FIG. 15

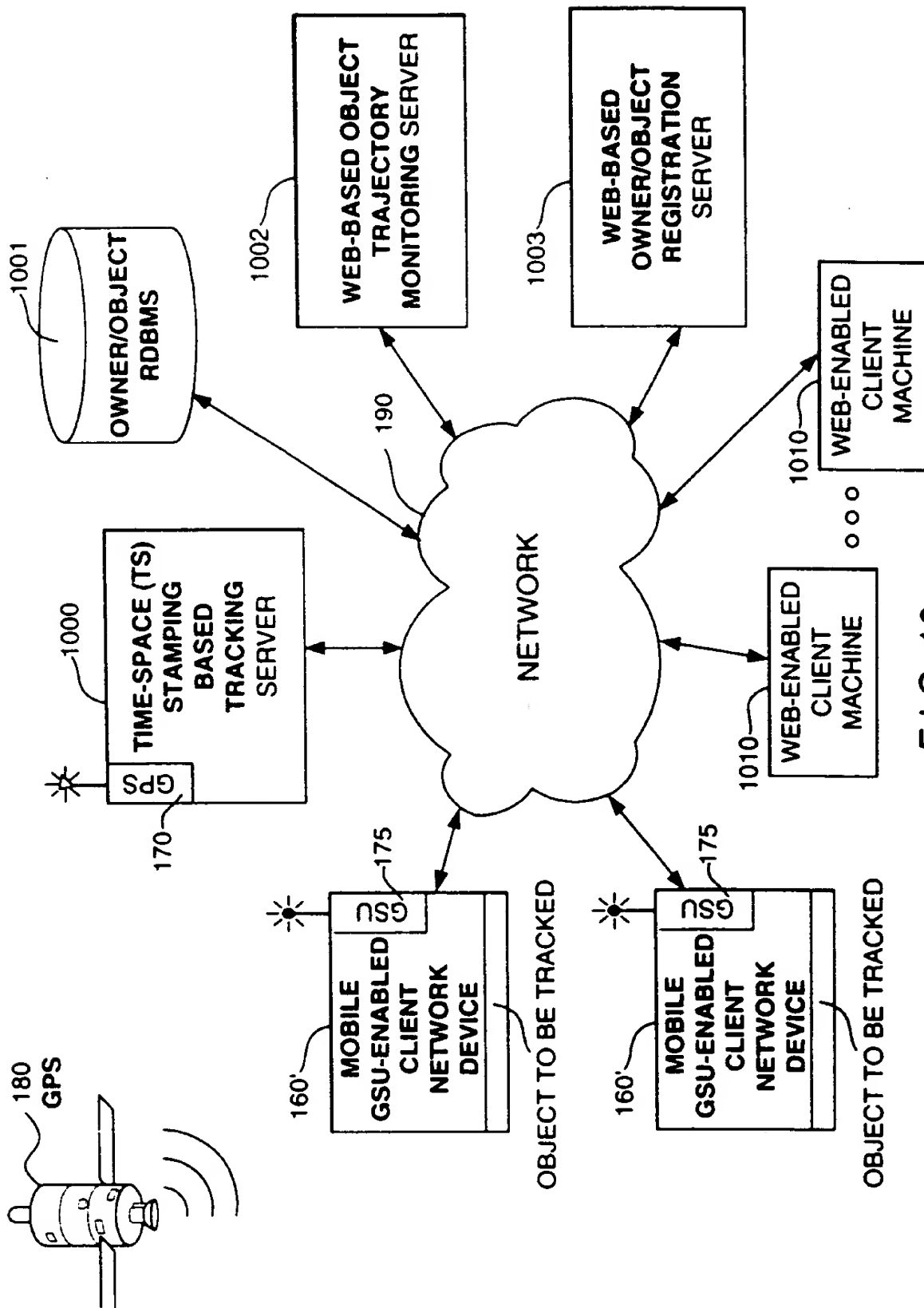


FIG. 16

# GSU-ENABLED CLIENT NETWORK DEVICE 160'

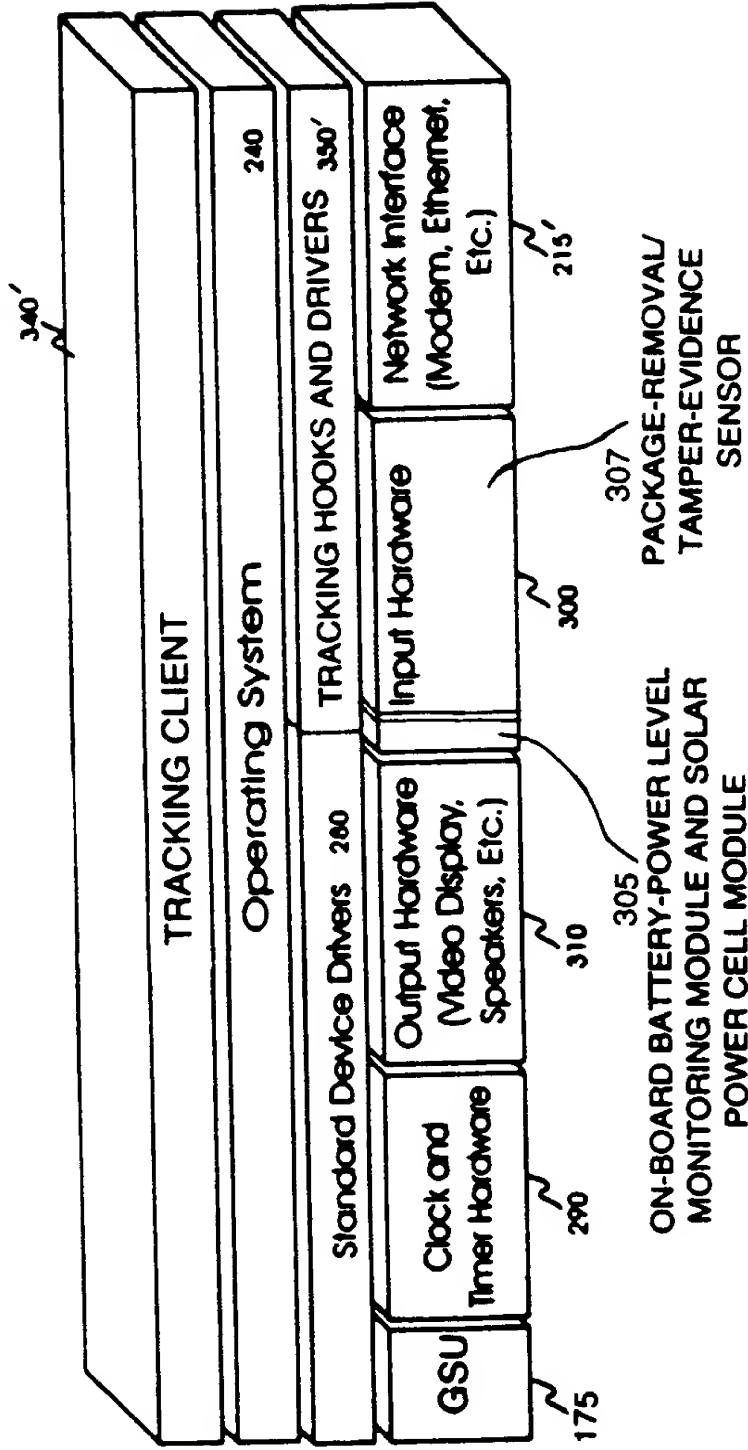


FIG. 16A

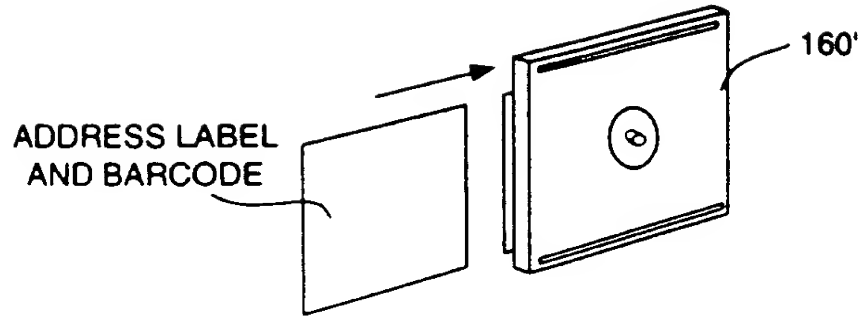


FIG. 16A1

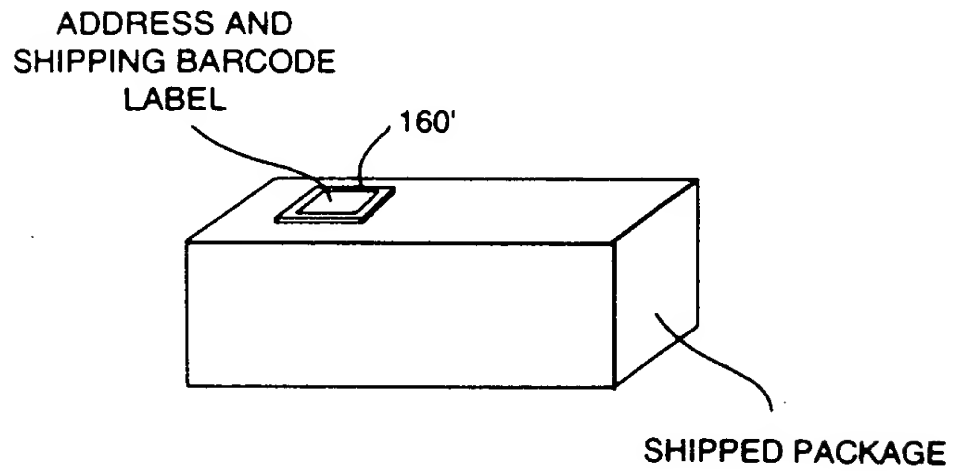


FIG. 16A2

# TS-STAMPING BASED TRACKING SERVER 1000

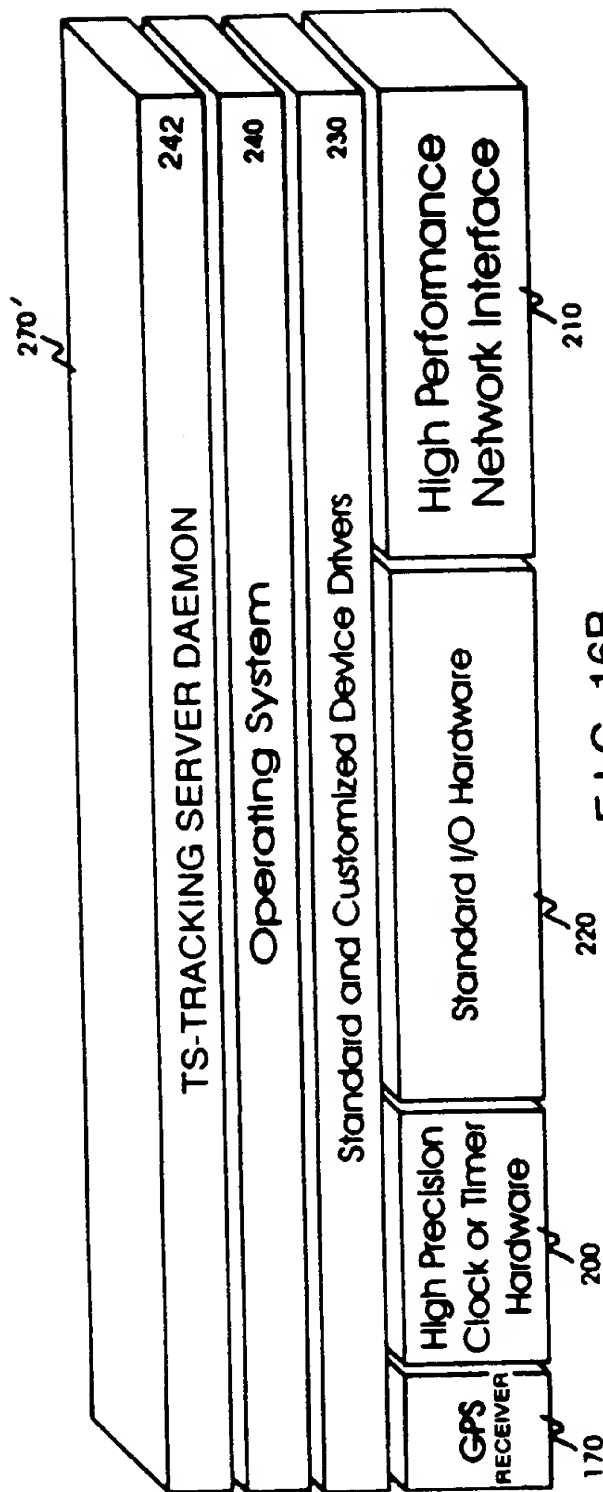


FIG. 16B



# WEB-BASED OWNER/OBJECT REGISTRATION SERVER 1003

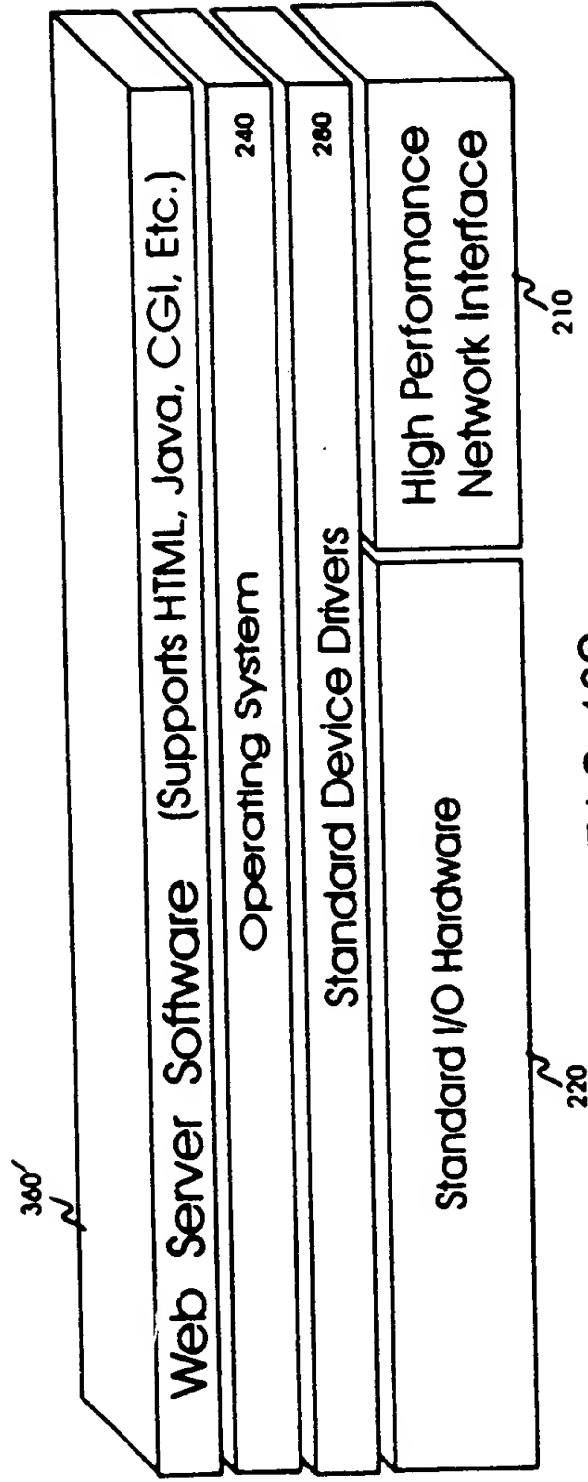


FIG. 16C

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# WEB-BASED OBJECT TRAJECTORY MONITORING SERVER 1002

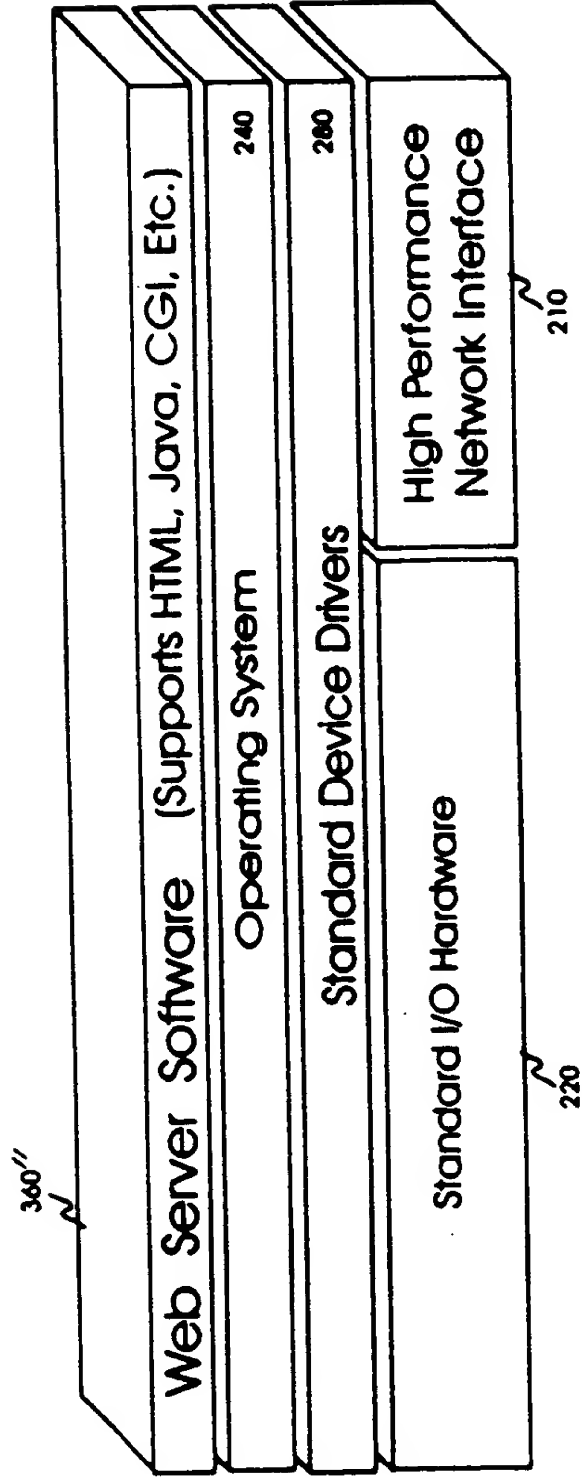


FIG. 16D

# TIME-SPACE (T,S) COORDINATE TRACKING OF MOBILE OBJECTS

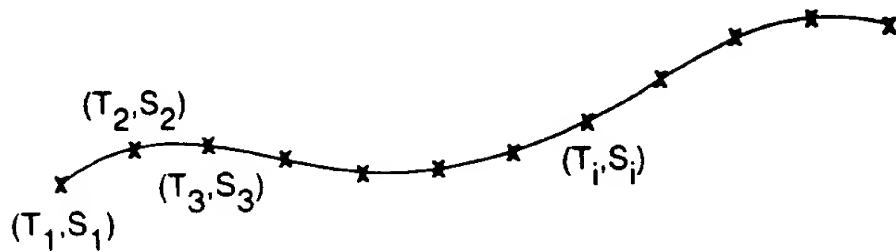


FIG. 17A

## TIME-SPACE (T,S) STAMPING OF STATIONARY OBJECTS TO DETECT MOVEMENT THEREOF

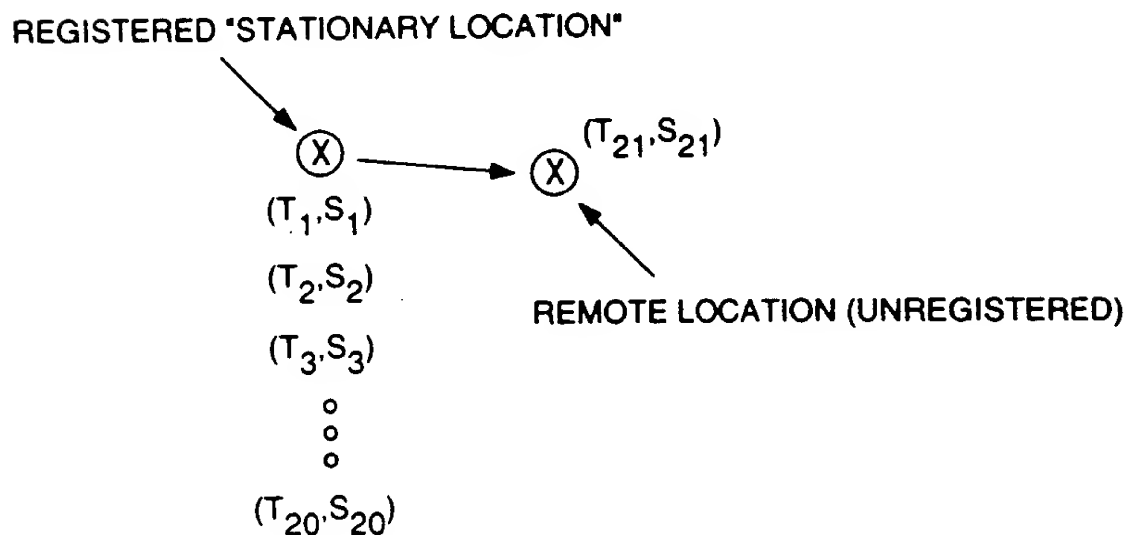


FIG. 17B

any other data that may be in the data set, or any other data that may be in the data set, or any other data that may be in the data set.

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OWNER/OBJECT DATABASE TABLE

| OBJECT NAME | OBJECT OWNER | GSU'S UNIQUE ID CODE (UIC) | TIME-SPACE STAMP                  | TIME-SPACE STAMP                  |
|-------------|--------------|----------------------------|-----------------------------------|-----------------------------------|
| TOM SMITH   | TOM SMITH    | 1567N2B0                   | (T <sub>1</sub> ,S <sub>1</sub> ) | (T <sub>1</sub> ,S <sub>1</sub> ) |
| JERRY DOG   | TOM SMITH    | 1568N2B0                   | (T <sub>1</sub> ,S <sub>1</sub> ) | (T <sub>1</sub> ,S <sub>1</sub> ) |
| VOLVO S80   | TOM SMITH    | 1569N2B0                   | (T <sub>1</sub> ,S <sub>1</sub> ) | (T <sub>1</sub> ,S <sub>1</sub> ) |
| ○<br>○<br>○ | ○<br>○<br>○  | ○<br>○<br>○                | ○<br>○<br>○                       | ○<br>○<br>○                       |
|             |              |                            |                                   |                                   |
|             |              |                            |                                   |                                   |

FIG. 18

# GSU-ENABLED CLIENT NETWORK DEVICE 160"

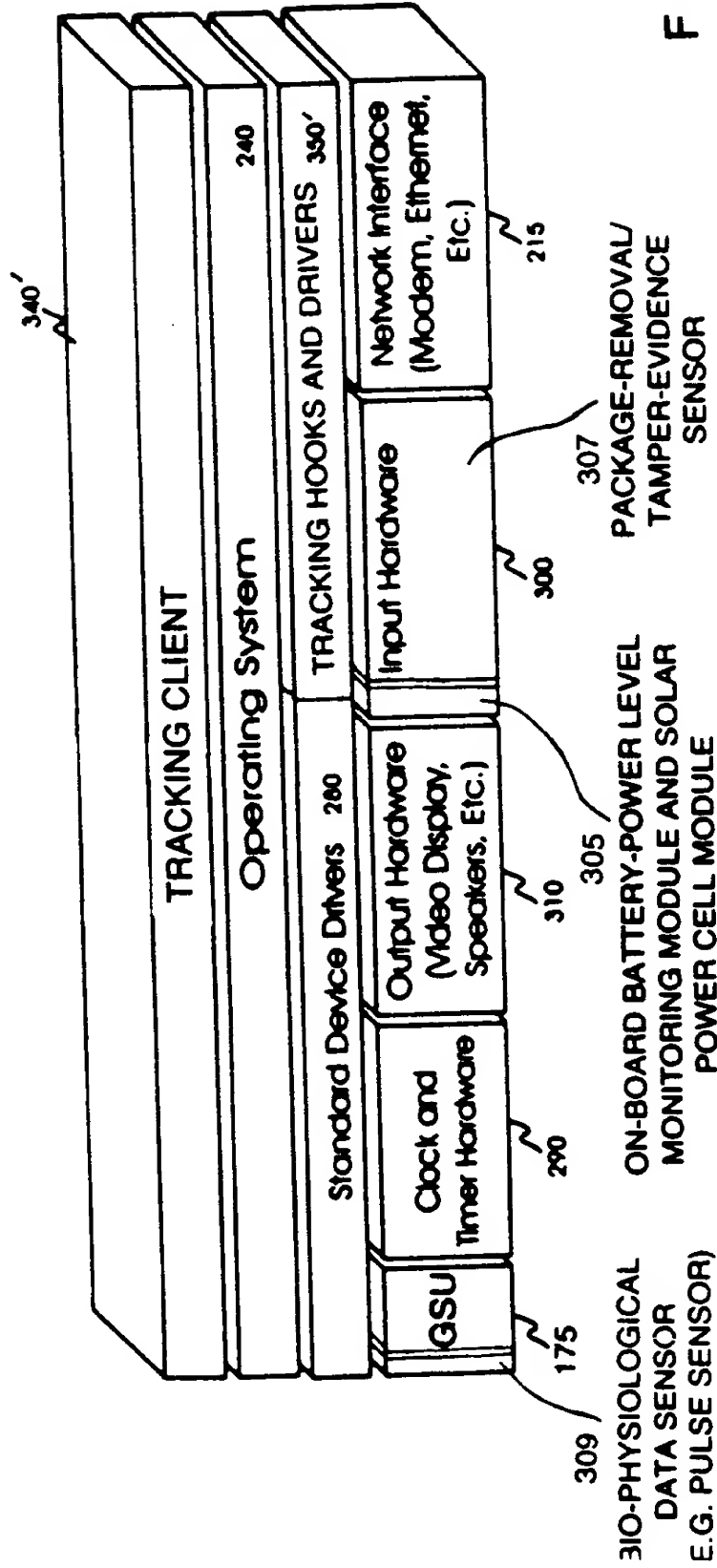


FIG. 19A

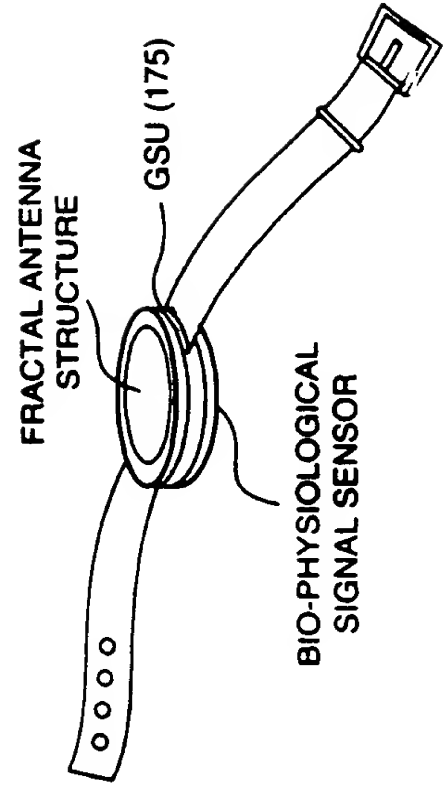


FIG. 19B

# TIME-SPACE BIOPHYSIOLOGICAL (TSB) STAMPING BASED TRACKING SERVER 1007

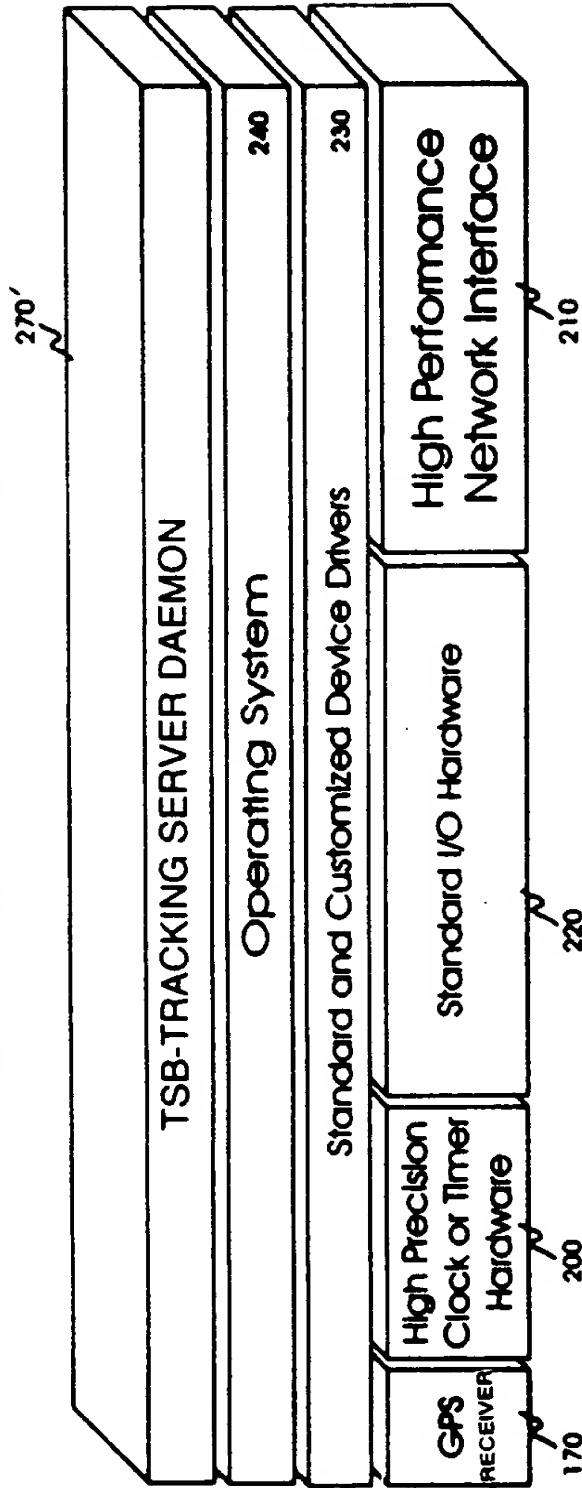
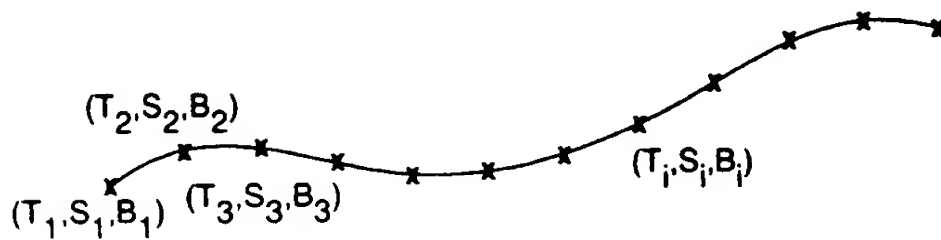


FIG. 20

(T,S,B) COORDINATE TRACKING OF MOBILE OBJECTS



F I G. 21

OWNER/OBJECT DATABASE TABLE

| OBJECT NAME | OBJECT OWNER | GSU'S UNIQUE ID CODE (UIC) | TSB STAMP         |     | TSB STAMP         |
|-------------|--------------|----------------------------|-------------------|-----|-------------------|
| TOM SMITH   | TOM SMITH    | 1567N2B0                   | $(T_1, S_1, B_1)$ |     | $(T_i, S_i, B_i)$ |
| JERRY DOG   | TOM SMITH    | 1568N2B0                   | $(T_1, S_1, B_1)$ |     | $(T_i, S_i, B_i)$ |
| VOLVO S80   | TOM SMITH    | 1569N2B0                   | $(T_1, S_1, B_1)$ |     | $(T_i, S_i, B_i)$ |
| ○<br>○<br>○ | ○<br>○<br>○  | ○<br>○<br>○                | ○<br>○<br>○       | ... | ○<br>○<br>○       |
|             |              |                            |                   |     |                   |
|             |              |                            |                   |     |                   |

F I G. 22

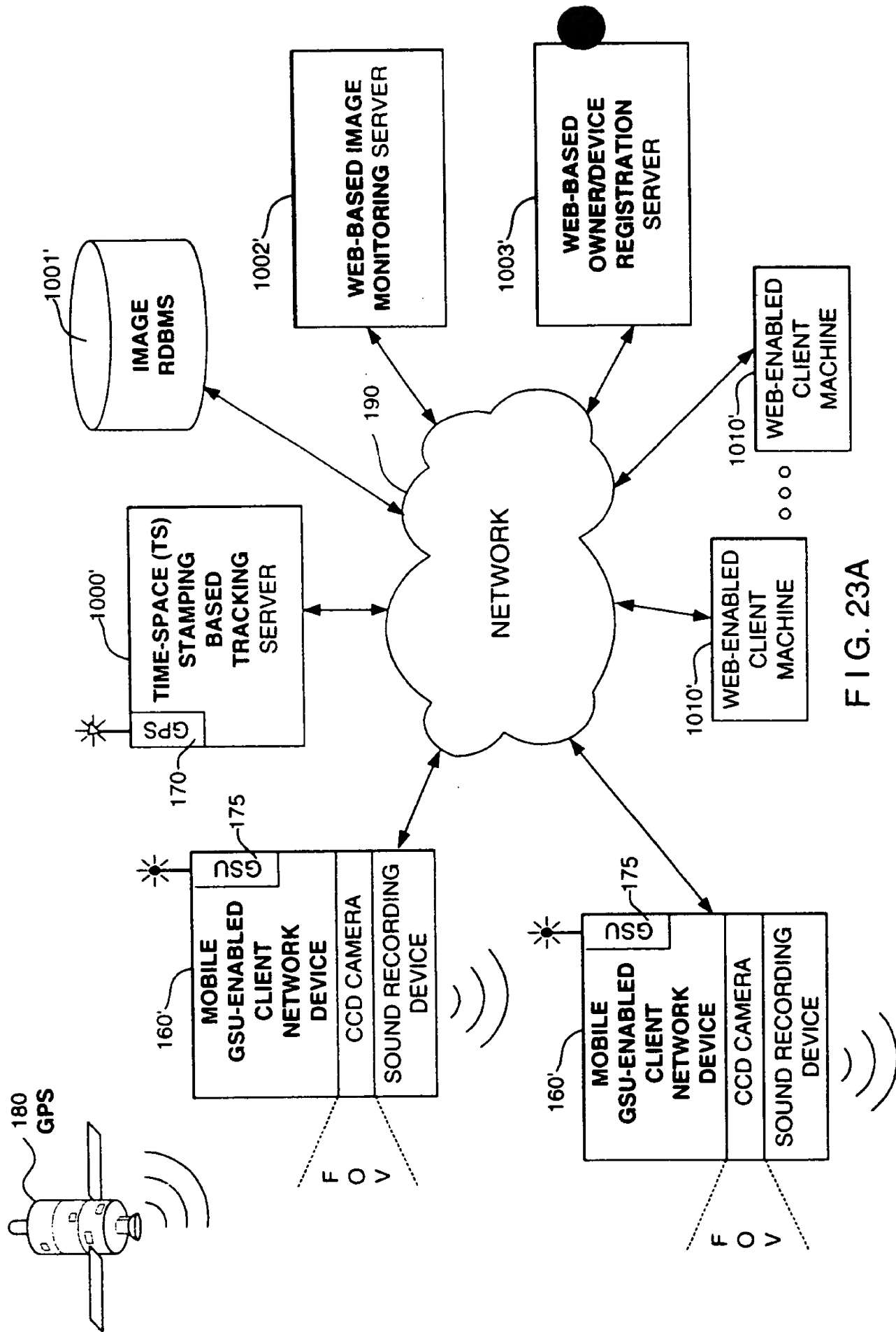


FIG. 23A



| GSU-ENABLED<br>CLIENT NETWORK<br>DEVICE | TS-STAMPED<br>CAPTURED IMAGE |    |     |    |
|---|------------------------------|----|-----|----|
|   | T1                           | T2 | ... | TN |
| X125132                                 |                              |    | ... |    |
| X123561                                 |                              |    | ... |    |
| ⋮                                       |                              |    |     |    |
| X351275                                 |                              |    | ... |    |

FIG. 23B

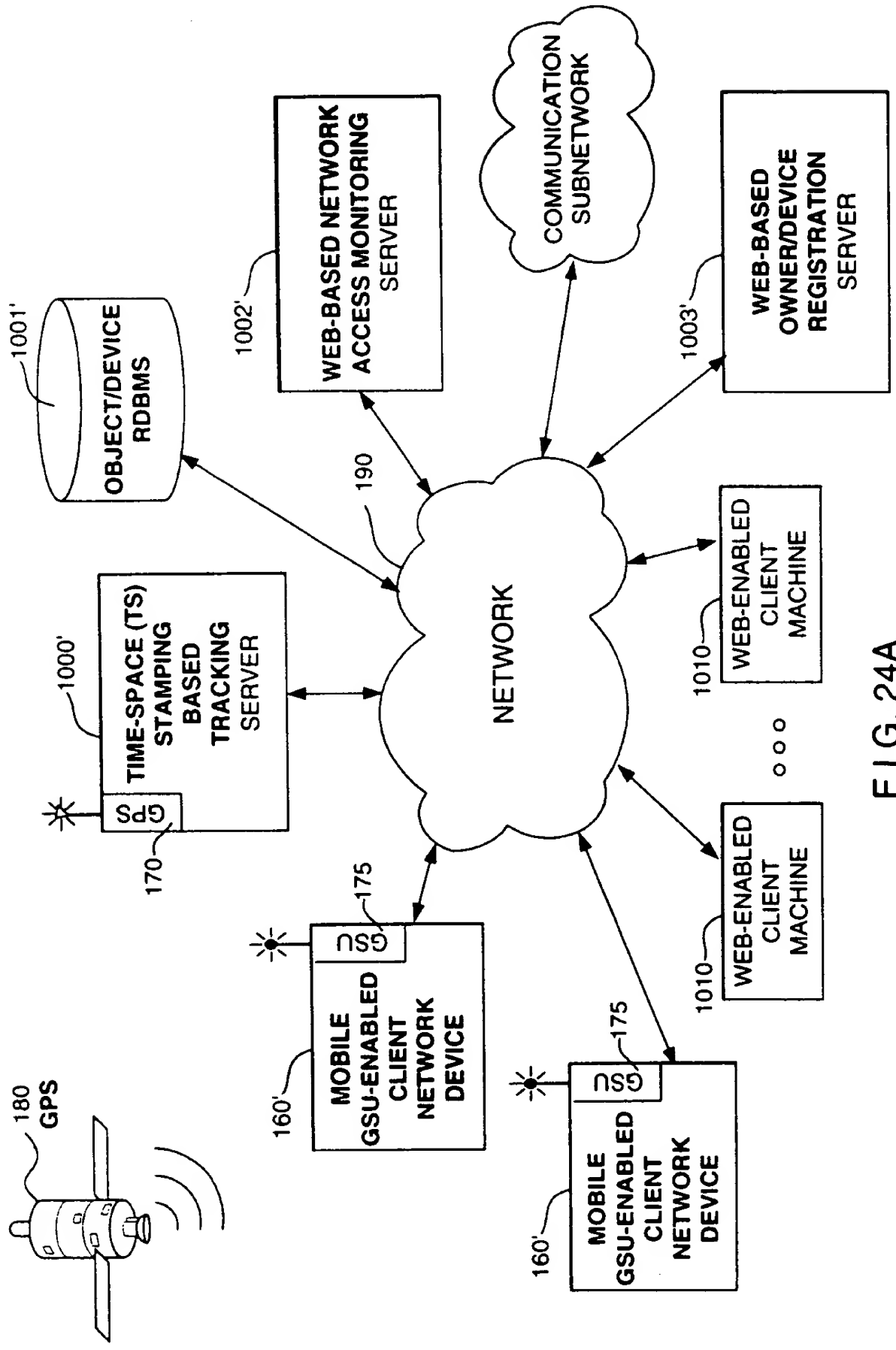


FIG. 24A

FIG. 24A is a block diagram of a network architecture for tracking and monitoring objects and devices.

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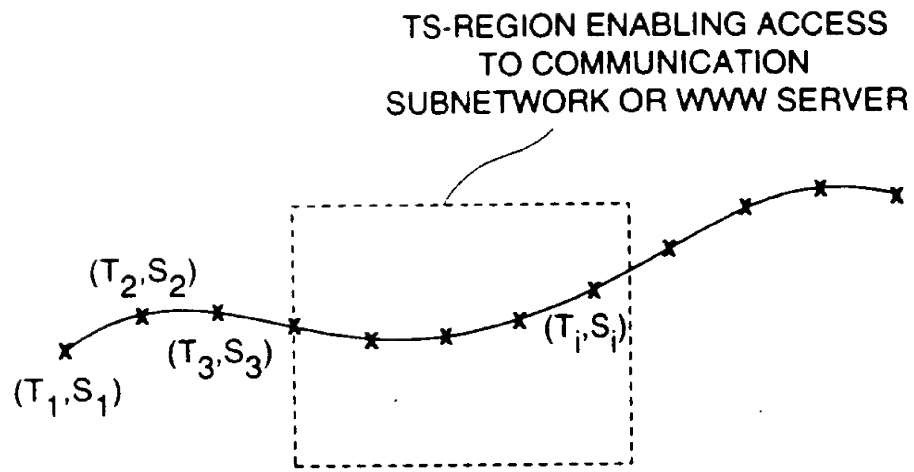


FIG. 24B

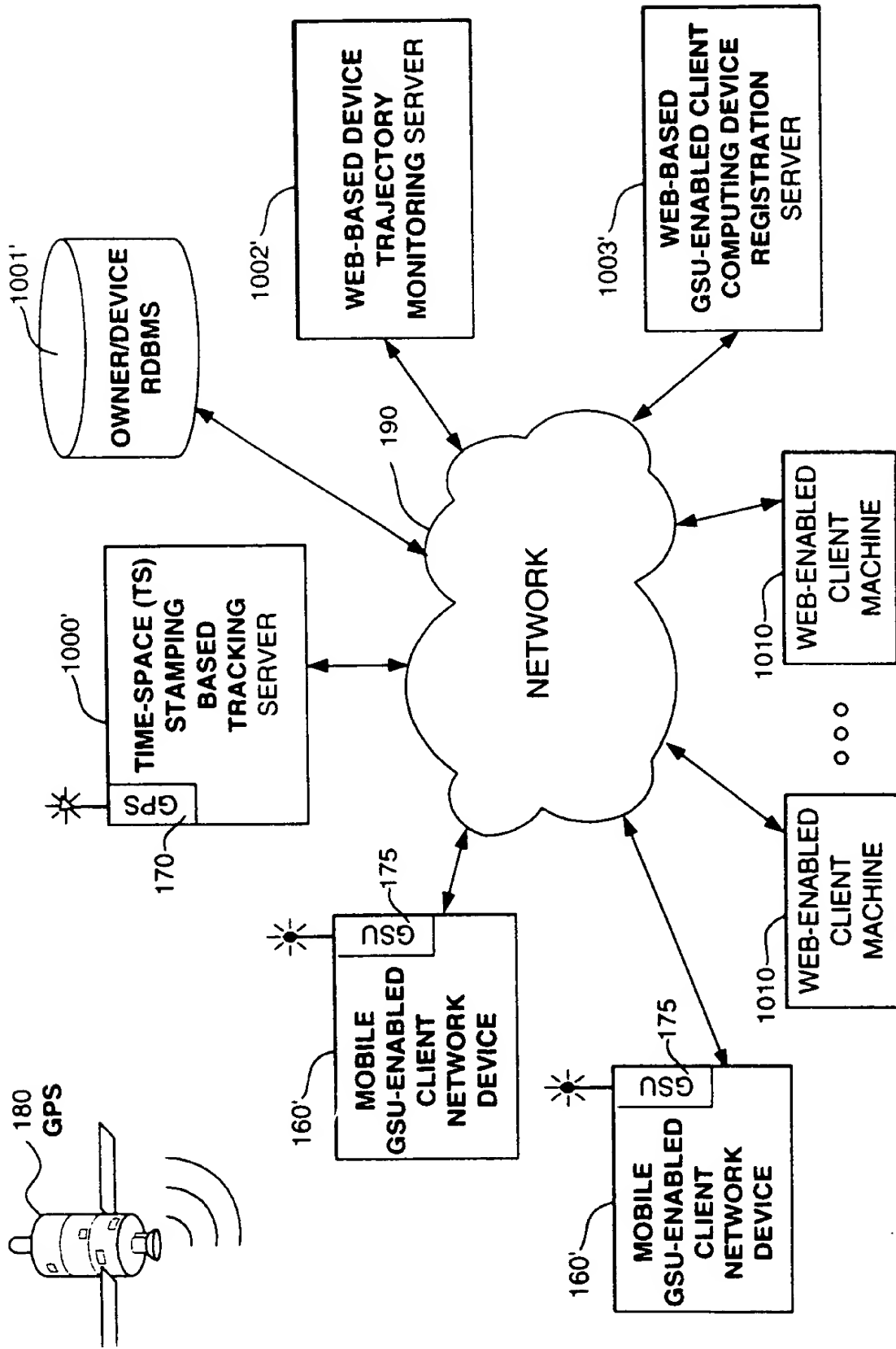


FIG. 25A

TS-REGION ENABLING DECRYPTION AND  
DISPLAY OF ENCRYPTED MESSAGES, ON GSU-  
ENABLED CLIENT COMPUTING DEVICE

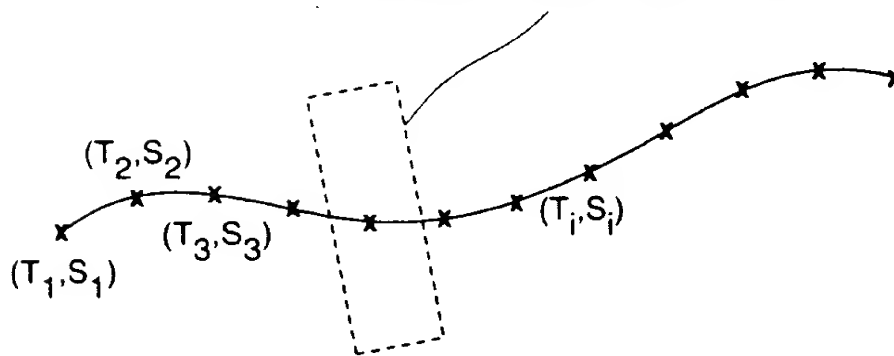


FIG. 25B

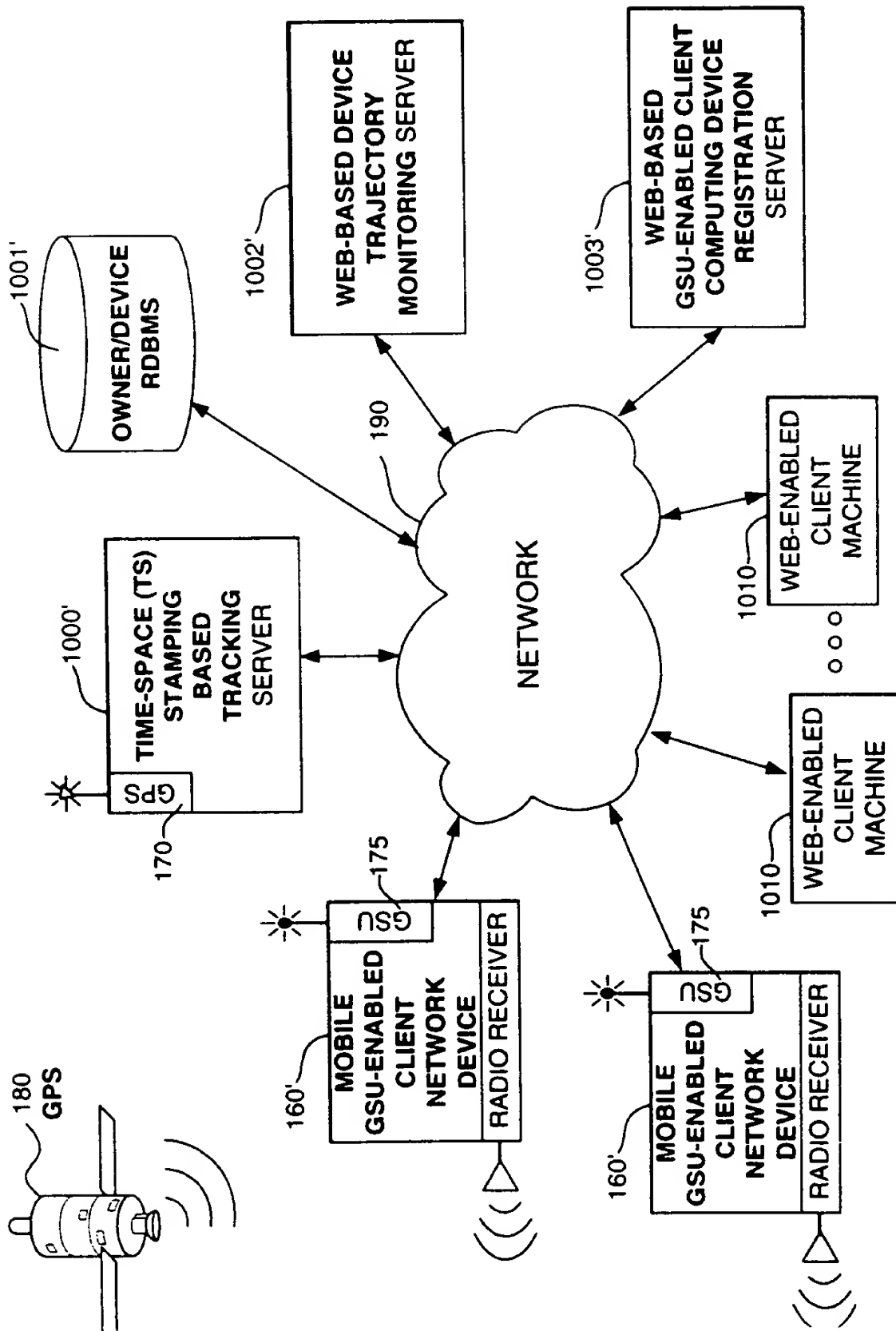


FIG. 26A

TS-REGION ENABLING DECRYPTION AND  
DISPLAY OF ENCRYPTED RADIO MESSAGES

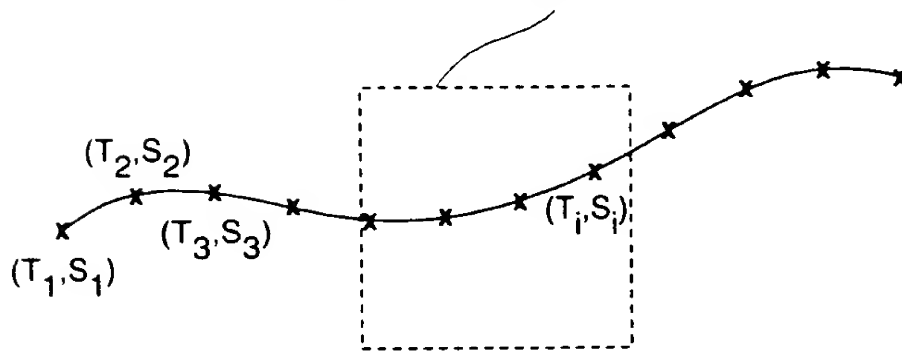


FIG. 26B

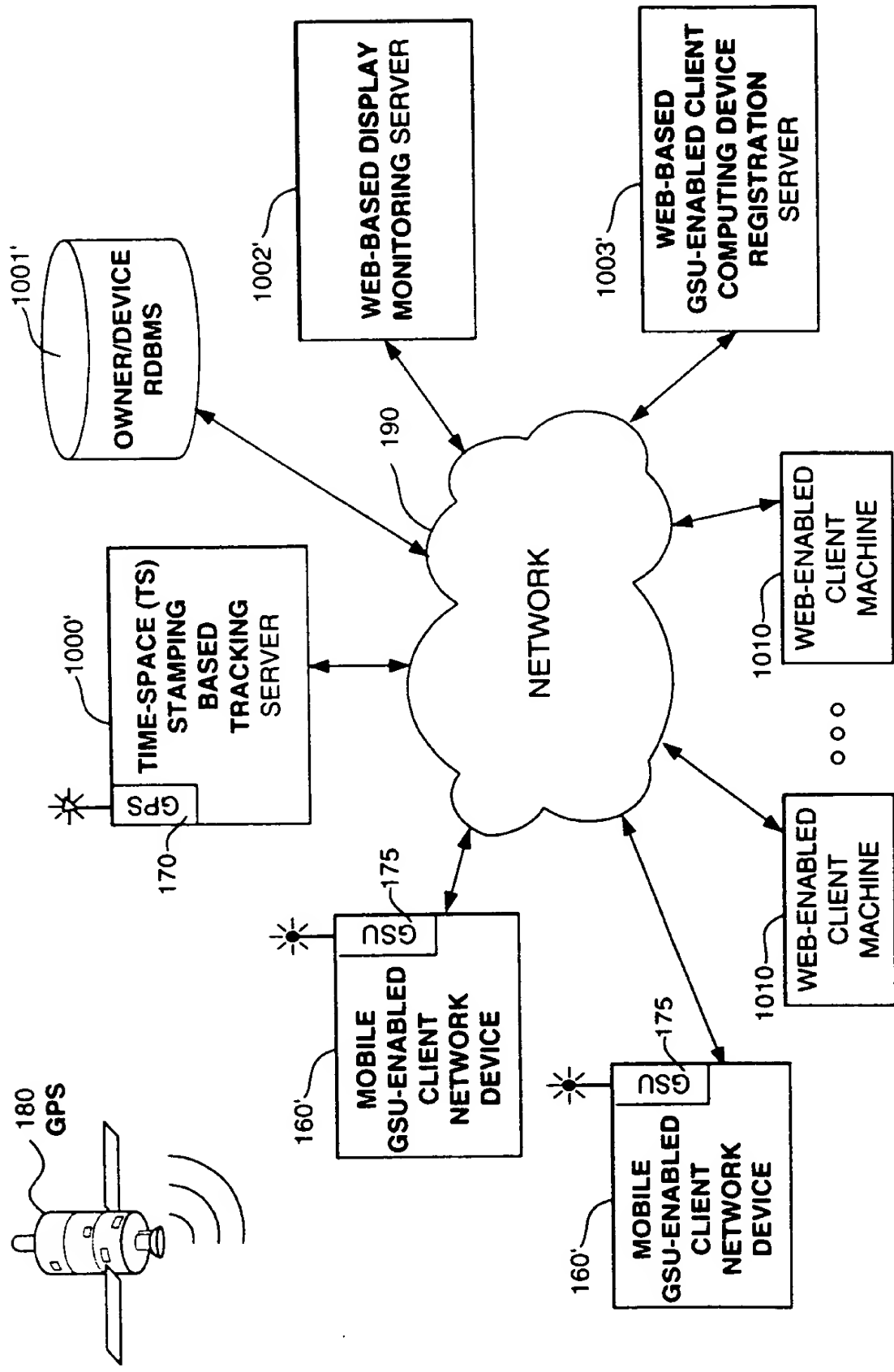


FIG. 27A

FIG. 27A is a block diagram of a network architecture for tracking and monitoring. The architecture includes a GPS satellite (180) and two mobile-enabled GSU-client network devices (160'). Each mobile-enabled GSU-client network device (160') includes a GPS receiver (175) and is connected to an antenna. The mobile-enabled GSU-client network devices (160') are connected to a central network (190). The central network (190) is connected to a web-enabled client machine (1010) and a web-enabled client machine (1010). The central network (190) is also connected to a time-space (TS) based tracking server (1000'), an owner/device RDBMS (1001'), a web-based display monitoring server (1002'), and a web-based GSU-enabled client computing device registration server (1003').



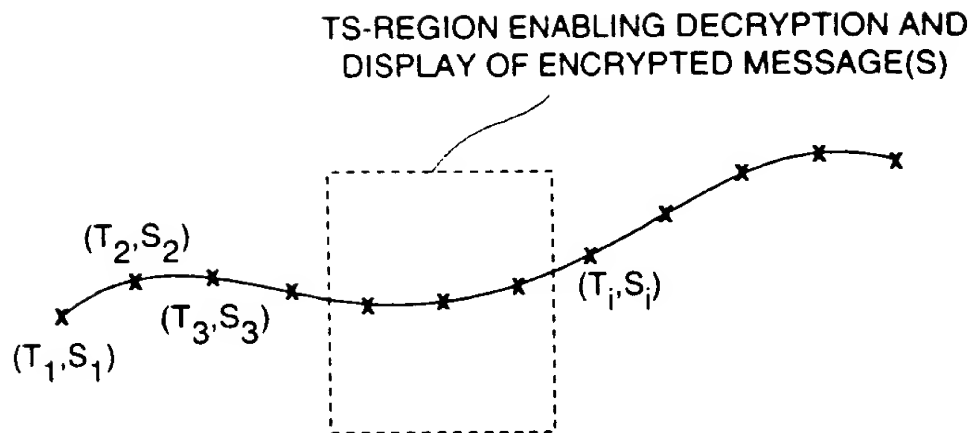


FIG. 27B

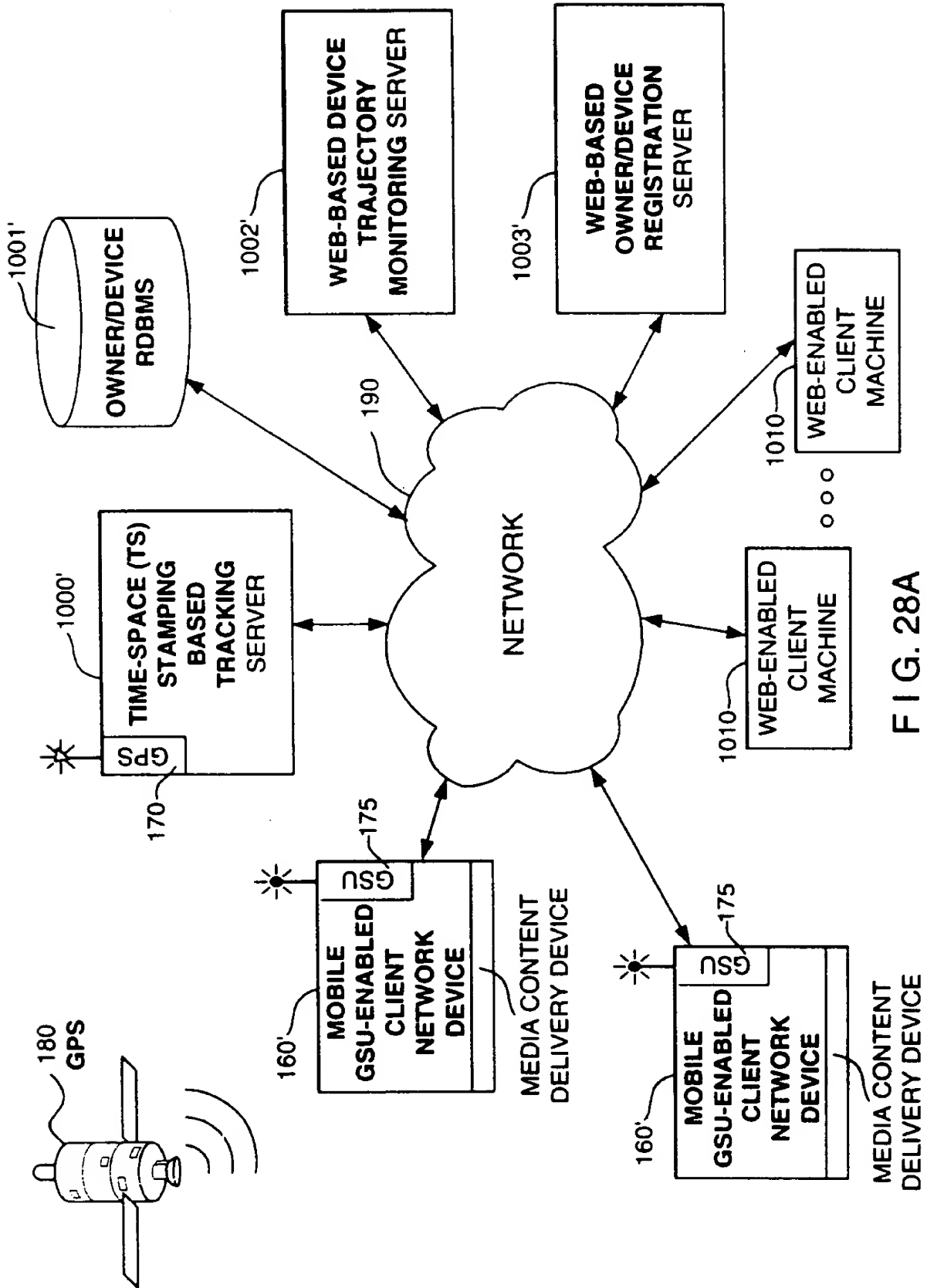


FIG. 28A

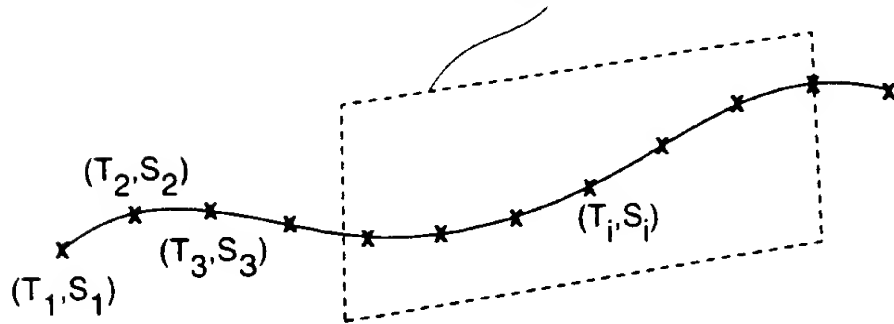
TS-REGION ENABLING OPERATION OF  
GSU-ENABLED MEDIA CONTENT DELIVERY DEVICE

FIG. 28B

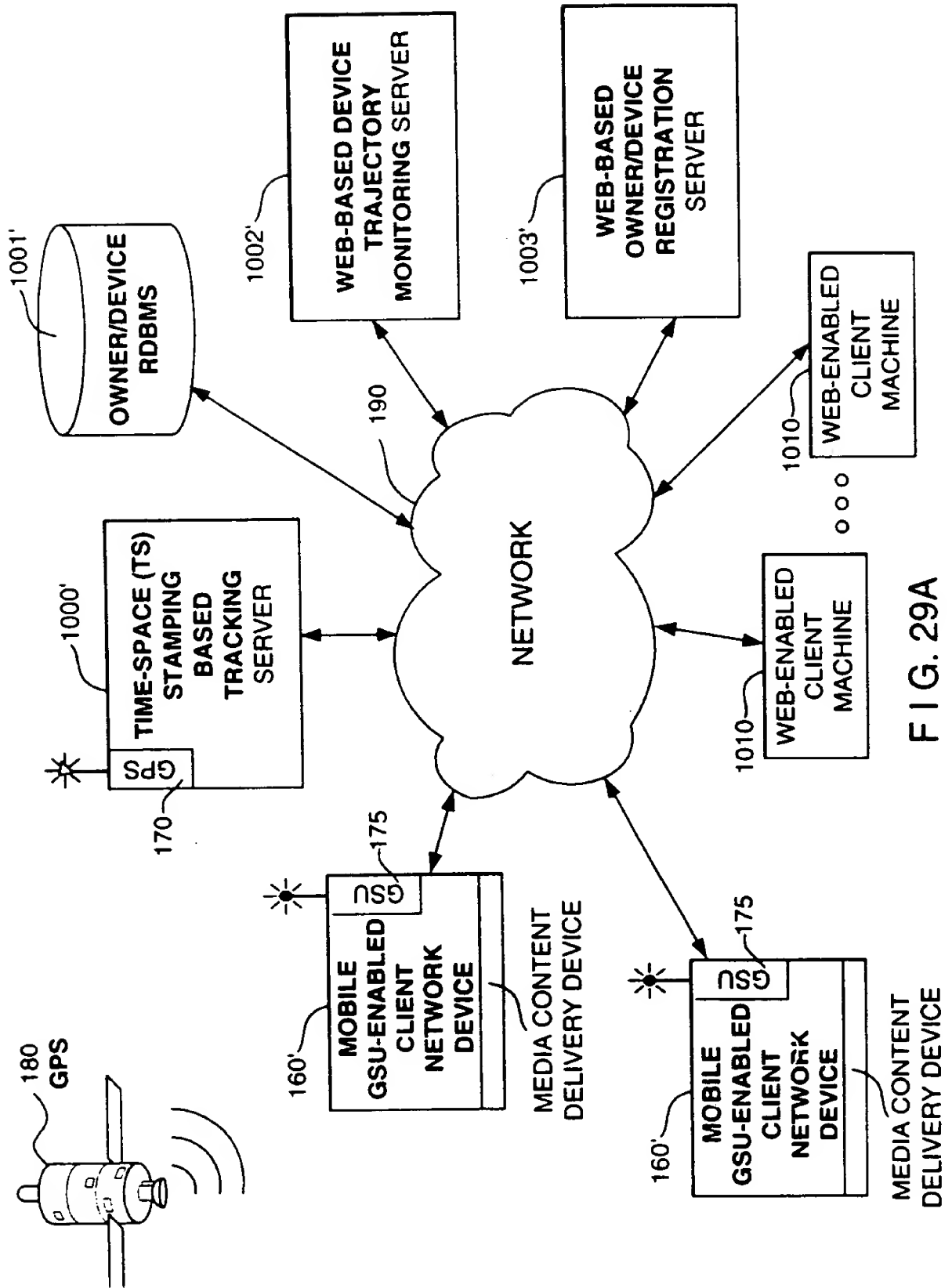


FIG. 29A

TS-REGION ENABLING OPERATION OF OR  
CONTROLLING A FUNCTION(S) WITHIN A (PORTABLE)  
HOST SYSTEM OR DEVICE OF PRESENT INVENTION

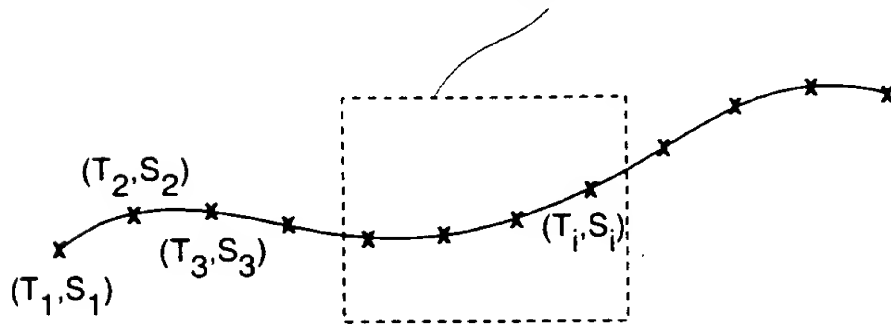


FIG. 29B